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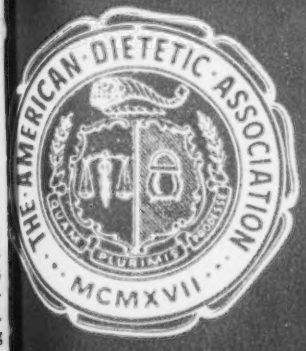

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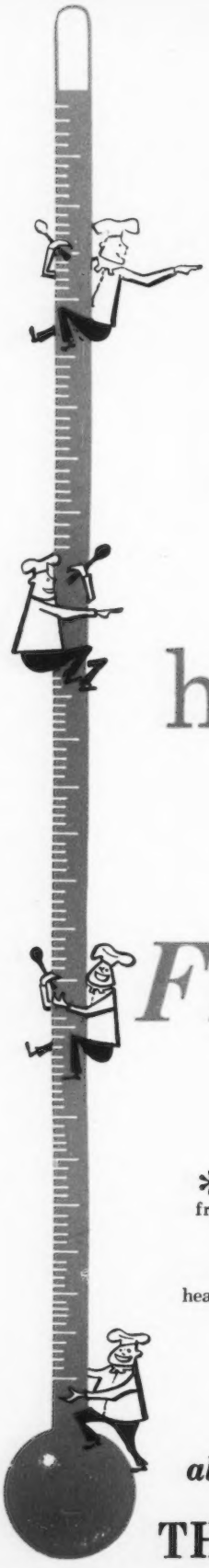

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Some Recent Advances in Clinical Nutrition[1]

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IN ONE sense every piece of research which succeeds in determining the correct answer to a question represents an advance. It does not matter whether the answer is negative or affirmative, provided it is the right answer. The question may appear to be of small importance, but still having it correctly answered advances knowledge. Often at first sight it may not be possible to tell what is of great importance from what is not. Even Sir Alexander Fleming, for example, greatly misjudged the importance of penicillin at first.

Sometimes the answer to what looks like a small question enables a large question to be answered. Sometimes, it may take the answers to ten thousand small questions, determined by ten thousand men in ten thousand laboratories, to enable one man in one laboratory to find an answer which benefits all mankind. Years after such an event, it may be possible to decide which pieces of basic research contributed most significantly to the final discovery, but the only safe viewpoint is the historical one.

In reviewing the recent past, therefore, I can only try to draw your attention to certain areas in which it seems *to me* that significant advances have been made. Space will not permit mention of more than a very small proportion of the large numbers of valuable papers which have been published, but a few key references may help anyone whose interest in any particular topic has been stimulated. Because of my own particular background I have been inclined to restrict my review to advances with a rather direct bearing on human nutrition. This is not to belittle the findings of those whose work might be called "pure" research in biochemistry. It is just that I am much more shortsighted in that direction and hence more likely to misunderstand the relative importance of things.

The first three topics have something in common in that they concern the body's need for nutrients not only in *adequate* quantities but also in *balanced* quantities.

Effects of Imbalance in Amino Acids

In recent years there have been many interesting reports of ill effects caused not by a primary limitation of any single amino acid but by imbalances in the supply of both essential and so-called unessential amino acids. For example, Salmon (1) has reported that the tryptophan requirement is increased if proteins deficient in that particular amino acid are added to a diet otherwise low in tryptophan. Similarly, growth depression may occur if a threonine-deficient diet is supplemented with valine (2). Deficiencies of certain B vitamins have also been made worse by the addition of amino acids to the diets (3). Finally, Harper and his co-workers (4) have demonstrated that in rats fed a predominantly rice diet, a lysine supplement adequate to prevent the development of fatty liver also promoted secondary deficiencies of other amino acids resulting in growth retardation.

Elvehjem and Harper (5), who have contributed a great deal to knowledge in this field, have recently briefly reviewed these findings and summarized the types of amino acid imbalance into three categories. First, increase in the supply of the most limiting amino acid in a diet poor in protein may provoke deficiency of the next most limiting amino acid. Conversely, an additional supply of the second most limiting amino acid may increase the deficiency of the most limiting amino acid. Second, excess of any amino acid may increase the severity of a marginal deficiency of the B-complex. Third, excess of an amino acid may reduce utilization of other amino acids present in normally adequate amounts and thus provoke a deficiency. Elvehjem and Harper also point out that the so-called "toxic" levels of the amino acids may occur with an intake only two to ten times the normal requirement. This is a narrow margin which we should not like to use in many drugs, and it must be borne in mind when considering the amino acid supplementation of any diet which may be deficient in more than one nutrient.

[1] Presented at the 38th Annual Meeting of the American Dietetic Association in St. Louis, on October 18, 1955.

The commercial manufacture of certain amino acids is going to make such supplementation a practical possibility. It may be justified in some cases. Albanese *et al.* (6) have suggested, for example, that in some cases the nutritive value of milk might be improved by adding lysine. But caution needs to be exercised. The moral, I suggest, is that you *can* have too much of a good thing.

Nutrition and Liver Injury

Recently, there has been considerable change in concepts of certain disorders of the liver which are, in part at least, due to nutritional deficiencies or imbalances. Microscopically, the liver may manifest injury in three characteristic ways: by fatty infiltration; by "cirrhosis," which is a chronic process of cell degeneration associated with the appearance of fibrous tissue; and by cellular death over large or small areas which we call focal or massive necrosis. In the past these have been considered to have common causative factors, the different response depending largely on the degree of insult and the periodicity of its application.

However, certain essential differences in the etiology of cirrhosis and necrosis are now recognized. These have been reviewed recently by Lepkovsky and Borson (7) and Popper and Schaffner (8). For example, the sulphur-containing amino acid, cystine, will protect the rat against hepatic necrosis but may actually increase cirrhosis. The other sulphur-containing amino acid, methionine, will protect against both cirrhosis and necrosis. Finally, the lipotropic factor, choline, will prevent cirrhosis but will have no beneficial effect on necrosis. Certain other substances, such as vitamin E and the so-called factor 3 of casein, are also protective against necrosis. It appears, therefore, that no single deficiency is involved—rather, these protective substances may have a common "de-toxifying" action perhaps applied directly in the defense of the liver enzyme systems.

Single deficiencies of certain other amino acids—threonine, glycine, tryptophan, and leucine—have also been reported to cause fatty liver, even in the presence of the lipotropic factor, choline, or vitamin B_{12}. Here again, the effect is not necessarily specific, but represents an upsetting of some balanced system. A paper by Best *et al.* (9) is also important in drawing attention to the fact that the fatty infiltration of choline deficiency differs histologically from that due to protein inadequacy.

Two other factors must be considered pertinent to the development of liver injury due to nutritional deficiencies. The intestinal bacteria may be a source of some sort of toxic action or, alternatively, may render unavailable some essential nutrient and precipitate a frank deficiency if this nutrient is available only in marginal quantity. In any event, certain antibiotics orally administered seem to provide a degree of protection against both necrosis and cirrhosis in the experimental animal (10). This effect is apparently not due to the permanent suppression of the bacteria but probably to a change in their metabolism.

For obvious reasons much of the experimental work referred to has been done in animals. However, the application of these concepts is of the greatest importance in human medicine. For example, the severe and widespread disease called "kwashiorkor," which has its basis in chronic protein deficiency, is manifested, among other things, by marked liver damage. Cirrhosis of the liver is common in the tropics, with or without kwashiorkor, and it is not unreasonable to suppose that nutritional deficiencies are primarily responsible for it. In some areas of the world, the association of liver cirrhosis with malnutrition and especially with protein deficiency is not a constant one, and Walters and Waterlow (11) have recently advanced the theory that there is a dual etiology—both nutritional deficiency and malarial infection being implicated.

Nearer to home, gross multiple deficiency is a rarity, but we do have the very real problem of cirrhosis, especially as it is seen in the chronic alcoholic. Some of the findings which I have discussed can be expected to contribute to the ultimate solution of this problem.

Unfortunately much of our information concerning the prevention of liver injury may not be directly applicable to the cure of established disease. A stage may be reached when irreversible changes occur in liver tissue. It is probable, for example, that deficiency of lipotropic factors, such as choline, is a major factor in causing cirrhosis of the liver in the chronic alcoholic, but the administration of choline itself has been disappointing as a specific therapeutic measure. On the other hand, general diet therapy may be very rewarding in these cases. Paradoxically, the same high- or moderate-protein diet which protects the liver from injury due to specific amino acid deficiencies may, under certain circumstances, prove deleterious once such injury has occurred. In acute necrosis and some cases of advanced cirrhosis, breakdown products of protein, thought to include ammonia, may lead to progressive coma and death. In these cases diets restricted in protein have been very beneficial (12).

Adequacy of Diets Low in Animal Protein

Reference has already been made to the protein-deficiency syndromes now known to be common in the underdeveloped areas of the world. There seems to be little hope that the agriculturalists can greatly increase the available supply of animal protein; on the other hand, it is, of course, far more economical to consume cereal protein directly than to feed it to animals for meat or milk. We may be able to revise some of our ideas about the poor biologic value of

vegetable protein in the light of two recent reports, which lend a ray of hope to the world situation.

Widdowson and McCance (13) have issued a report of a comprehensive experiment carried out on German orphanage children in 1947 and 1948 in which the subjects were closely observed for over a year while taking a diet supplying 75 per cent of the total calories as bread. Supplementary vitamins were provided, and the over-all protein intake apparently met currently recommended allowances. However, the total animal protein was only about 8 gm. a day. The children were initially sub-normal in height and weight and in general development as a result of previous undernutrition. On the diet provided, however, they demonstrated rapid growth and development. After one year, some of the children had their diet supplemented by extra milk, but six months later this supplemented group could not be distinguished clinically from a control group receiving no milk supplement. The adequacy of the original diet was thus further emphasized. An attempt was made to assess differences between breads baked with flours of different extraction rates and containing varying degrees of enrichment with B vitamins, but the final conclusion was that no difference in nutritive value could be detected.

Another paper by Hegsted and his co-workers (14) has drawn somewhat similar conclusions from a study made in Peru on young adults. Nitrogen equilibrium was approached on an all-vegetable diet providing 25 gm. protein a day, 62 per cent of which were cereal proteins. Despite the necessarily unusual nature of these diets, they appeared to be adequate in total protein and in specific amino acids, although there was some improvement in nitrogen retention with lysine and methionine supplementation. The point is made, I think, that the *right combination* of cereal or vegetable proteins may be able to provide the requirement of amino acids as well as animal protein can.

One possible hazard of totally vegetarian diets may be the development of a clinical syndrome, thought to be due to vitamin B_{12} deficiency. The first reports of this came from Holland (15); subsequently Wokes, Badenoch, and Sinclair (16) investigated 149 pure vegetarians in England. In Europe, incidentally, these people have coined the term "vegans" to distinguish themselves from less strict "vegetarians" who eat dairy products. Of this group, 27 per cent apparently complained of transient oral symptoms such as soreness of the tongue, 20 per cent had paresthesia, and a similar proportion complained of pains in the back and spine, sometimes associated with stiffness. Menstrual disorders also occurred. Such symptoms apparently will occur only after some time, perhaps years, on this type of diet. They are reported to be relieved by vitamin B_{12}. The average blood picture showed slightly low red blood cell counts and macrocytosis, but hemoglobin levels were virtually normal. Serum vitamin B_{12} levels varied considerably but were below normal in the whole group. However, there was no correlation between these vitamin B_{12} levels and any other blood findings.

Preliminary investigations have been made into certain possible metabolic effects. The incidence of symptoms was higher in the English group of vegans than in the Dutch group, while no such syndrome was reported in American pure vegetarians by Hardinge and Stare (17). It is postulated that the total protein intake may be a determining factor. It is, of course, too early to be sure that this syndrome is a straightforward vitamin B_{12} deficiency, but its importance, as I see it, lies not in its application to the health of the few hundreds or thousands of Europeans or Americans who elect to eat such diets, but to the millions whose animal protein intake is strictly limited by circumstances.

Dietary Treatment of Steatorrhea

Within the past five years, progress has been made in determining the underlying causes of certain diseases manifested by failure to absorb fat from the diet. The discovery in 1950 by Dutch workers (18, 19) that celiac disease in children could be cured by a diet free from wheat gluten has been confirmed by several workers in England, particularly by a group at Birmingham University. Ross and her co-workers (20) recently reported their experience with thirty children with celiac disease treated in this fashion. Twenty-eight of these children showed marked improvement, clinical recovery being paralleled by improvement in fat absorption, growth performance, hemoglobin level and by diminution in the dilatation of the small intestine. The return of wheat gluten to the diet, even in minute amounts, usually produced a relapse. In the two children who did not respond to this diet, the steatorrhea was apparently due to a deficiency of bile salts in one case and to fat intolerance of unknown etiology in the other. Similar findings have been recorded by Gerrard and others (21). The same group of workers has examined the part played by wheat or rye gluten in other disorders of a like nature, namely, "idiopathic" steatorrhea in the adult and so-called tropical sprue (22). Of twelve patients with idiopathic steatorrhea treated by a gluten-free diet, five showed complete and permanent recovery but the other seven showed no improvement. Ruffin and others (23) have reported improvement in three cases.

It seems, therefore, that some cases of "idiopathic" steatorrhea in adults may be due to gluten intolerance and others not. Tropical sprue does not apparently respond to a gluten-free diet, but folic acid or intensive antibiotic therapy may produce a complete cure. French (24) has suggested that tropical sprue may be associated with the ingestion of unsaturated fats and that there may be a com-

mon mechanism for many of these disorders dependent on several possible forms of intestinal irritation.

Incidentally, we may learn something from observing that celiac disease was thought by many to be due directly to an intolerance to dietary fat because fat absorption was impaired. Others had noted empirical improvement on diets free from bread, and thought that the offending nutrient was carbohydrate. The controversy is ended, apparently, by the discovery that the cause is neither fat nor carbohydrate, but sensitivity to a specific protein.

Possible Relation of Diet to Atherosclerosis

There is no doubt that the high incidence of atherosclerosis in the United States, as manifest by the high death rate from coronary heart disease, is one of the most pressing public health problems of the day. The disparity between the death rates from this cause in this country and elsewhere certainly demands explanation. It has been postulated that a relatively high dietary intake of fat leads to an increase in serum cholesterol or lipoprotein levels and that these changes in turn may lead or contribute to the development of atherosclerosis. Although it is difficult to see at the moment just how far we have advanced in finding the answer to this question, without a doubt anyone interested in clinical nutrition is eagerly watching the situation.

As is so often the case, this problem demands many approaches. Atherosclerosis may be produced in the experimental animal by diets low in choline or low in methionine and high in cholesterol. Recently Buckley and Hartroft (25) have reported that the addition of large quantities of vitamin D to the choline-deficient diet increases the incidence of aortic sclerosis. The mechanism of these effects is undetermined, and the direct relevance of the deficiencies to the condition in human beings seems doubtful. However, the experimental approach is essential as a means of unravelling the metabolism of the lipid components of the blood which are under suspicion.

The preponderance of evidence suggests that the blood cholesterol level is affected by the animal fat content of the diet. Pomeranze *et al.* (26) report that hypercholesteremia is reduced by fat restriction without caloric restriction but that weight reduction without fat restriction is ineffective. On the other hand, weight reduction in the obese atherosclerotic may reduce post-prandial hyperlipemia. The same group (27) has also found no evidence in favor of any of the supposed decholesterolizing agents and comments on the extreme fluctuations in the serum cholesterol levels in some subjects receiving no specific therapy.

There has been some controversy concerning the effects of vegetable fats on the serum cholesterol. Ahrens and his associates (28) and a group in Toronto (29) both report consistent falls in serum cholesterol when animal fat is replaced isocalorically by vegetable fat. However, the latter group had earlier found converse effects using mixed diets (30) and have postulated interaction between vegetable and animal fat components when both are present. The latter paper also reports data confirming that dietary cholesterol itself, up to about 1 gm. a day, does not increase the blood cholesterol.

Much of the evidence linking the dietary fat intake with atherosclerosis has been adduced from studies of various ethnic groups in different parts of the world. These have generally indicated that reduction in the level of dietary fat is paralleled by falls in average blood cholesterol level and often by a reduced incidence of atherosclerosis.

The latest such studies (31, 32) have reported on the diet, serum cholesterol levels, and incidence of atherosclerosis in the South African Bantu, and their findings follow the same pattern. It is clear, however, that dietary factors are not the only variables among these groups which might affect the incidence of arterial disease. Friedman, Rosenman, and Byers (33) reviewed this subject and concluded that, with the data presently available, there is no definitive evidence that the level of dietary fat *per se* can increase the incidence of atherosclerosis. Certainly, the chain of evidence is highly circumstantial, and other factors, such as primary damage to the arterial walls and hypertension, may be the essential etiologic agents with hypercholesteremia acting as a secondary aggravating factor. While on this general subject, I should like to mention a paper of much wider scope entitled "Diet and Life Span" by Martin and Ruth Silberberg (34), which you might find interesting.

In limiting this brief review to only five topics, I have necessarily failed to mention much work of significance. For example, Moore and his associates have learned much about iron metabolism, using radioactive isotopes (35, 36), and Goldsmith and her group are continuing to investigate niacin needs and the niacin-tryptophan relationship (37).

Conclusion

You cannot look back over the recent past and say that any single discovery has radically changed our concepts of scientific nutrition. We are, however, becoming increasingly aware of the world-wide problem of protein deficiency and are recognizing and studying the associated clinical states. The importance of nutritive balance as well as total nutritive supply is being recognized, and some of the effects of imbalance are known. The probability that certain types of overnutrition may be as deleterious to health as undernutrition is being investigated. Questions are being asked and answered, and inevitably we are arming ourselves and future generations with knowledge which will lead to better nutrition and hence to better health.

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Many things difficult to design prove easy to performance.—*Samuel Johnson*

Current Concepts in Diabetes Mellitus

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DIABETES mellitus is a chronic disorder of carbohydrate metabolism characterized by relative or absolute insulin lack. It is accompanied by secondary derangements in fat and protein metabolism and leads to polydipsia, polyphagia, polyuria, weight loss, dehydration, stupor, coma, and death if untreated.

The significance of the disease is evident if we consider that in 1953 there were more than 25,000 deaths from diabetes (1). In addition to the persons dying from diabetes, many others with diabetes die of vascular complications and are classified in other categories of mortality statistics. It has been estimated by the American Diabetes Association that there are one million known and another million as yet undiscovered persons with diabetes in the continental United States.

Etiology

The specific etiology of diabetes is unknown. However, there is general agreement that there is a strong hereditary component. Studies to date indicate that a predisposition to diabetes mellitus is inherited in the great majority of the cases as a Mendelian recessive characteristic (2). Data gathered in Oxford, Massachusetts, demonstrated the increased incidence with age and indicated that the onset and progression are influenced by more than genetic factors (3, 4). Therefore, it appears that this inherited susceptibility is affected by metabolic and environmental factors that determine its significance.

Chemically, diabetes is characterized by a high blood sugar, and subsequently by sugar in the urine. Both defects are easily amenable to insulin therapy. However, it appears that simple insulin deficiency is not the only derangement possible in diabetes. Early in the 1930's, Houssay removed the pancreas from toads and produced clear-cut diabetes. It was soon demonstrated that the diabetes was ameliorated if either the pituitary gland or adrenal cortex was removed. In addition, large amounts of either adrenal cortical extract or anterior pituitary hormone could cause diabetes (4). The thyroid hormone and the sex hormones have also been implicated in carbohydrate metabolism as well as the newly discovered substance, glucagon, the hyperglycemic glycogenolytic hormone that may be produced by the alpha cells of the islets of Langerhans of the pancreas (5, 6). In addition, acute inflammation of the pancreas in acute pancreatitis or in mumps has been reported as causing a temporary or permanent diabetic state (7). Toxic diabetes may be produced by alloxan (4), cobaltous chloride, and other substances (8). Diabetes has also been associated with various gross lesions of the pancreas (9).

In view of these factors, plus the endocrine interrelationships, diabetes must be considered as a disease of hereditary background with a multiplicity of interrelating substances that may play a role by disrupting an already precarious *insulin* balance (4, 5, 7).

Diagnosis of Diabetes Mellitus

The diagnosis of diabetes mellitus is established by the demonstration of an elevation of the blood sugar above normal. The abnormality may be demonstrated by a fasting blood sugar, postprandial blood sugar, or the glucose tolerance test.

In the evaluation of the level of blood sugar, the state of the patient, whether fasting or postprandial, must be taken into consideration. In Table 1 are listed the diagnostic criteria used at the Boston City Hospital Diabetes Clinic. Table 2 lists the criteria employed in the interpretation of the 100-gm. oral glucose tolerance test.

While the presence of sugar in the urine is certainly suspicious and indicates that further work-up is necessary, it is never a basis for diagnosis as glucose may appear in the urine in diseases other than diabetes and in patients with low renal thresholds. In addition, other reducing substances may also be present. For example, the usual Benedict's test is positive for glucose, fructose, lactose, and a whole gamut of other reducing substances. Conversely patients with elevated blood sugars may not exceed the renal threshold for glucose in the early stages of diabetes mellitus and spill no sugar in the urine.

In a study carried out in 1946 based on a screening of 3186 persons in Brookline, Massachusetts by the

TABLE 1

Diagnostic criteria for the interpretation of fasting and post-prandial venous blood sugar tests in the diagnosis of diabetes mellitus—Boston City Hospital

BLOOD SUGAR VALUES		INTERPRETATION
Somogyi-Nelson "true blood sugar" (11)	Folin-Wu "total reducing substances" (12)	
Fasting Test		
mg./100 ml.	*mg./100 ml.*	
110 or more	130 or more	Diabetes usually present*
90–109	110–129	Further study needed†
Less than 90	Less than 110	Diabetes usually absent
2 Hr. Post-Prandial Test		
160 or more	180 or more	Diabetes usually present*
120 to 159	140 to 179	Further study needed†
Less than 120	Less than 140	Diabetes usually absent

* Results should be confirmed by post-prandial blood sugar or glucose tolerance test.

† Repeat post-prandial blood sugar or glucose tolerance test.

U. S. Public Health Service (10), it was shown that of 112 persons with glycosuria who were retested, only 35.7 per cent had diabetes. Thus it should be understood that a urine test alone, whether positive or negative, may be misleading.

Types of Diabetes Mellitus

It was indicated in an earlier section on etiology that there may be many factors which influence the insulin balance of the body. Whatever the specific effect of each may be, recent evidence has again turned us to the pancreas and insulin as being highly significant in our clinical understanding of diabetes.

It is well known that juvenile diabetic patients are among the more difficult to control; that adults are generally more amenable to therapy (with some exceptions); and that there are relatively more mild, asymptomatic patients in the older age groups. On a basis of clinical findings plus recent studies of Wrenshall and co-workers (13), Bornstein and Lawrence (14), and others we may divide patients with diabetes into: (a) juvenile, (b) middle age, (c) elderly.

Juvenile Diabetic Patients. Almost all patients with the onset of their diabetes occurring at age twenty or less fall into this group. These are the patients who have total or near total diabetes as far as endogenous insulin is concerned. The studies carried out by Wrenshall and co-workers on the extractable insulin of the pancreas at post-mortem examination of these "growth onset" patients have shown (13) that only negligible amounts of insulin were present. Kelly, Rao, and Jackson observed (15) that within a year of the diagnosis of diabetes in juveniles, the amount of insulin needed to maintain control and growth fell into a regular pattern which increased with the age of the patient until the growth period was passed. This indicates that the patients

TABLE 2

*Criteria of the 100-gm. oral glucose tolerance test**

TIME AFTER GLUCOSE	MINIMUM READING CONSIDERED POSITIVE†	
	Somogyi-Nelson (11)	Folin-Wu (12)
	mg./100 ml.	*mg./100 ml.*
Fasting	110	130
1 hr.	170	200
2 hr.	120	140
3 hr.	110	130

* Patient is prepared by a carbohydrate intake of 200 gm. or more for each of three days prior to the test and an overnight fast before the test.

† INTERPRETATION: (adapted from that used in the diabetes studies of the U. S. Public Health Service after consultation with leading specialists in diabetes):

1. If 3 or 4 hourly readings equal or exceed the minimum values shown, diabetes is indicated.
2. If 1 or 2 hourly readings are positive, potential diabetes may be indicated.
3. If no readings are positive, diabetes is absent.

were "total diabetics." Bornstein and Lawrence (14), on a basis of blood insulin assays, found them to have a complete absence of insulin in their serum.

Clinically, these patients are labile and more difficult to control and are the type who, if they deviate markedly from their prescribed therapy, will go into diabetic acidosis. A small number of middle aged and even elderly patients seem also to fit into this pattern of extremely labile diabetes with marked dependence on exogenous insulin.

Middle Aged Patients with Diabetes. The majority of the diabetic population fit into this group. These are the subjects who, by the aforementioned techniques of Wrenshall and Bornstein, have significantly less but not a total absence of pancreatic extractable insulin and a decrease in their circulating insulin.

Many are overweight and can be controlled on a restricted diet alone. The majority of the others in this "maturity onset" group are easily controlled on small amounts of insulin. As noted above, a small number are labile and behave as the patients with juvenile diabetes.

Elderly Patients with Diabetes. Most elderly diabetic patients have easily controllable disease. There are, however, an ill-defined group who are asymptomatic, spill little if any sugar in their urines, but show elevated post-prandial blood sugars and abnormal glucose tolerance tests. They often have vascular disease and many have their carbohydrate abnormality discovered only when they are having routine blood chemistries made for other reasons. A group of patients among whom this finding is often observed are those who are in the hospital for gangrene and other peripheral vascular disease (16). Whether they have true diabetes or merely a decreased carbohydrate tolerance concomitant with aging (and due to abnormalities at the intestinal mucosa and/or the pancreas) remains to be elucidated.

Treatment

It has been pointed out in the literature (17) that the over-all objectives in the treatment of diabetes are:

(a) Alleviation of symptoms and signs.

(b) Maintenance of adequate growth and nutrition.

(c) Preservation of the functional integrity of the beta cells of the islets of Langerhans.

(d) Prevention of complications.

(e) Maintenance of the emotional well-being of the patient, leaving him a useful and not a dependent member of society.

The major tools utilized by the physician to attain these aims are: (a) diet, (b) insulin, (c) activity, (d) proper hygiene, (e) good patient-doctor relationship, and (f) the integration of the diabetic routine of the patient with his everyday activities. In hospital out-patient services or other units where it is possible, a team effort involving dietitian, nurse, social worker, and physician will accomplish maximum results.

Diet

There are several factors to be considered in prescribing the diet:

(a) The nutritional needs of the individual must be met. Sufficient calories should be prescribed to meet the demands for growth and development and to maintain a desirable level of weight. In addition, the need for other essential nutrients must be met by a diet planned to contain adequate amounts of the foods which supply those nutrients.

(b) A day-to-day constancy in food intake is necessary. This implies that approximately the same amount of protein, fat, and carbohydrate must be consumed daily.

(c) Regularity in a meal schedule and spacing of the food throughout the day is important for good control.

(d) Individualization of the dietary plan for each patient, taking into consideration such factors as food preferences, place of eating, and economic status will help to assure better adherence to the diet.

(e) Adequate initial dietary instruction with repeated discussions at periodic intervals is vital for the purpose of disclosing misconceptions and strengthening the background knowledge about the diet.

The six "Exchange Lists" and method of planning diabetic diets developed by a joint committee of The American Dietetic Association, American Diabetes Association, and the Diabetes Section, U. S. Public Health Service (18) was designed to provide a simple, practical, and easily adjustable guide to meal planning. This system has been widely adopted by hospitals, clinics, and private physicians and has proved in the five years since its introduction to be most acceptable to patients.

TABLE 3

*Time of action of various insulin preparations after injection**

TYPE OF INSULIN PREPARATION	EFFECTIVE ONSET	PEAK	DURATION
	hr.	*hr.*	*hr.*
Regular crystalline or amorphous	1–2	3–4	4–6
NPH (neutral protamine Hagedorn)	4–5	12–16	20–24
PZI (protamine zinc insulin)	6–10	16–20	20–30
Globin	2–4	10–16	16–20
Lente (insulin zinc suspension)	4–5	12–16	20–24

* Modified from Ashe (19).

Insulin

The role of insulin in the therapy of diabetes mellitus has been striking. The hormone, a product of the beta cells of the islets of Langerhans in the pancreas, was first demonstrated by Banting and Best in 1921–1922 and later isolated in crystalline form by Abel. Recent studies have shown that it has all the chemical reactions of a typical protein. The potency of the individual preparation is determined by comparing its hypoglycemic action with that of the International Standard crystalline preparation (adopted in 1935) which has a potency of 22 I.U. per milligram. Table 3 lists the types of insulin currently in use plus the time of effective onset, peak action, and duration of each. It should be remembered that all these values represent averages and may vary in each individual preparation according to manner and depth of injection, freshness of insulin preparation, accuracy of measurement, and many other factors. Regular insulin is a fast-acting preparation and is used exclusively in diabetic acidosis and coma. It is also used to supplement treatment during infections and surgical procedures and is often mixed with longer acting preparations to obtain smoother control. It is the only preparation that can be given intravenously.

The other preparations utilize various protein-buffer systems (except for lente, which is an insulin zinc suspension without protein) to prolong their action. NPH is one of the more commonly used, but the other forms are often adequate if one understands their time cycle of action.

Standardization of equipment in large municipal hospitals avoids much confusion among patients, nurses, and physicians. At the Boston City Hospital, ½ in. or ⅝ in. needles and U-80 syringes and insulin are used exclusively.

Evidence at present indicates that injection perpendicular to the skin surface is desirable (20, 21). This will lower the incidence of lipodystrophies and prevent the occasional intradermal injection that may occur when the patient uses acute angle injections.

Activity

Activity as a factor affecting the level of the blood glucose and the well-being of the patient must

always be considered. The patient should always understand the relationship that exists between activity and the danger of insulin reactions. Generally, patients with diabetes should not be restricted, but rather encouraged to exercise and participate in all sports. Caloric adjustments can be satisfactorily made as shown by the fact that many successful and well known figures in the world of sports have diabetes.

Hygiene

Good personal hygiene is to be encouraged among all people. Those with diabetes, however, must be particularly careful. The incidence of infections is generally higher among the diabetic population (especially the poorly controlled ones). When an infection does occur, it makes the control of the diabetes much more difficult. In a detailed survey in Philadelphia, it was found that among 3106 patients with diabetes, there was twice as much tuberculosis as in a comparable group of non-diabetics (22). In addition, there was three times as much active tuberculosis among the tuberculous diabetic patients as there was in a sample of tuberculous non-diabetic persons matched by age, race, and sex. The authors concluded that not only does the diabetic population have more tuberculosis, but when it does develop, it is more likely to be of a significant character. Correlation with control of diabetes in this study was difficult to assess.

Why persons with diabetes are prone to infection and why they are difficult to control when infection is present is not clear, but recent evidence tends to point to a biochemical abnormality as affecting resistance to infection (23). Abnormalities in lactic acid production in the leukocytes of diabetic persons has been demonstrated by one group of investigators while another has shown that lactate in the presence of low oxygen tension has a deleterious effect on the tubercle bacillus (24).

Patients with diabetes have more skin infections than the normal population and a higher incidence of urinary tract infections (25). Infections about the feet and epidermophytoses are also not uncommon. The foot lesions are particularly significant, for with improper management of an infected foot with poor circulation, loss of the limb can easily occur (26, 27).

Thus, it is well to orient all diabetic patients from the inception of their disease to proper bodily hygiene in all its aspects.

Psychologic Aspects

It has become increasingly evident that the treatment of the diabetic patient involves more than the manipulation of diet and insulin. Literature has been slowly accumulating on the relation of the emotions to diabetes mellitus. These can be roughly divided according to Falstein and Judas (28) into several categories:

(a) The relationship between emotional disturbances and the onset of diabetes.

(b) The relationship of emotions and the course of diabetes.

(c) The personality structure of the diabetic person.

(d) Emotional reactions to diabetic management.

In a disease entity such as diabetes, where the patient's life routine is disrupted by the necessity to regulate his eating practices and perhaps take daily injections of insulin, it is not unexpected that varying emotional responses occur. The four aspects mentioned above are receiving and certainly deserve more attention. The emotional reaction of the patient to this disease is of particular significance. The personality of the patient must be preserved, and prophylactic measures must be taken so that the life of the juvenile and of the adult patients does not become incidental to the management of their diabetes. Starr (29) has included ideally:

(a) An optimal liberalization of the diabetic regimen.

(b) The avoidance of diabetic overcentralization.

(c) Socio-economic rehabilitation—for the family, if necessary.

(d) Self-management in juvenile diabetic patients to prevent over-dependence on the parent.

(e) Adequate social, educational, and recreational program.

Control of Diabetes Mellitus

There are several strong schools of thought when one considers the rigidity or laxity with which the diabetes of the patient should be controlled.

Chemical Control

Several groups believe that a measured diet with carefully regulated insulin dosage should be prescribed so that the patient is as nearly normoglycemic and aglycosuric as possible. The reasons are:

(a) Experimentally there is some evidence that uncontrolled diabetes may be associated with lesions similar to those observed in human patients with diabetes who have complications of long standing (17).

(b) Premature arteriosclerosis has been reported in patients with diabetes caused by gross adventitious disease of the pancreas (17).

(c) Finally, carefully followed cases for twenty to thirty years appear to demonstrate that continuous aggressive treatment directed toward maintenance of normal blood sugar is of importance in reducing the severity and incidence of degenerative complications (30–34).

Clinical Control

At the opposite end of the spectrum we have those who believe in clinical control of diabetes—that is, disregarding hyperglycemia and glycosuria as long

as the patient is symptom-free, ketone-free, and maintains his weight. Free dietary regulation is usual within this framework (35, 36).

It is believed by the advocates of this regimen that there is no conclusive evidence of the association of elevated blood sugar and sugar in the urine with complications. The feeling of well-being of the patient is thought to be of paramount importance. These clinicians also point out the dangers of severe hypoglycemia resulting in permanent brain damage that occasionally may occur from overtreatment.

Intermediate Control

Between the two extremes of thought lies the thinking and practice of probably the great majority of physicians (37). It does appear experimentally that there is some evidence of elevated blood sugar being deleterious to the organism. In addition, it seems to be an accepted fact that the inexorable march of diabetes with time leads to such complications as retinopathy, nephropathy, and premature arteriosclerosis (38). There is evidence that closer control may reduce or delay these complications. It would, therefore, seem good medical practice to control the patient closely but not be entirely negative and restrictive. The exchange system of meal planning allows a wide choice of foods and a certain amount of realistic flexibility still within a framework of good caloric control. The long-acting insulin preparations allow us to keep the patient's blood sugar levels almost normoglycemic for a large part of the day.

Since all the activities of life influence the course of diabetes, a satisfactory therapeutic regimen cannot be established or adjusted in a hospital. Hospitalization is desirable only for the management of complicating conditions or emergencies.

Thus we should regard the person with diabetes as a whole. Diet should be nutritionally adequate and practical. Insulin should provide control but avoid hypoglycemic reactions. The total therapeutic regimen should be pointed towards the patient's living a full and untrammelled life; it should not be centered about his disease (39).

Complicating Factors in Treating Diabetes Mellitus

Many untoward events may take place in the course of therapy of diabetes mellitus. Complications, in general, can be classified either as short-range or long-range, and depicted as in the following outline.

I. Short range
   A. Insulin reactions
   B. Diabetic acidosis and coma
II. Long range
   A. Triopathy (40)
      1. Neuropathy
      2. Nephropathy (Kimmelstiel-Wilson disease, diabetic glomerulosclerosis)
      3. Retinopathy
   B. Premature arteriosclerosis affecting primarily
      1. Coronary arteries with
         a. Angina pectoris
         b. Coronary insufficiency
         c. Myocardial infarction
      2. Cerebral vessels with varying cerebrovascular accidents
      3. Peripheral vessels with peripheral vascular insufficiency and gangrene

From a short-range point of view, one must beware of overtreatment and the precipitation of insulin reactions. Multiple insulin reactions may not only cripple the patient psychologically but prolonged insulin shock may result in irreversible brain damage as Lawrence and others have clearly demonstrated (41). Patients should be familiar with the manifold symptoms of insulin reactions and be prepared to counteract them by appropriate treatment.

On the other hand, inadequate dietary and insulin control, especially in the labile patient, may result in diabetic acidosis and coma. The management of this condition, though far better understood through recent advances in our knowledge of electrolyte and fluid balance, still carries a relatively high case fatality rate (42). Many such episodes precipitated by overeating, omission of insulin, infections, and so forth are preventable, and maximum prophylactic efforts must be made. The patient in acidosis is an acute medical emergency. Since the major deficit is insulin, the other metabolic and electrolyte derangements being secondary, large amounts of insulin given early and repeatedly in the acidotic patient will lower the number of fatalities. Proper understanding of electrolyte deficits as defined by the groups of Atchley (43), of Butler (44), and of Nabarro (45) have shown the value of hypotonic electrolyte solutions (whether they be fructose or hypotonic saline solutions). It has been demonstrated that the use of potassium soon after therapy has started will prevent deaths in hypokalemia (46).

The long-range complications of diabetes include those specific to the disease, i.e. diabetic retinopathy, neuropathy, nephropathy, and those associated with premature arteriosclerosis.

The patient who has had diabetes for fifteen years or more is often the victim of vascular or degenerative complications. The relationship between these complications and control has been briefly discussed. The pathogenesis of premature arteriosclerosis in the diabetic person and of the lesions in the retinae, kidneys, and nerves is not completely understood. There is no specific treatment for any of these. Thus, while insulin successfully combats hyperglycemia, it is not a cure for diabetes. The long-term complications stand as major signposts of future work still needed.

Diabetic Neuropathy

Root coined the term "triopathy" to include nerve, renal, and retinal lesions (40). Diabetic neuropathy is a common finding in any group of diabetic patients. Reports of its incidence have varied from 0.1 to 93 per cent (47). It appears, though, that if all degrees are included, the clinical incidence in the total population of a diabetic clinic is about 50 per cent and the significant incidence about 5 per cent of all diabetic patients. It generally appears in older patients and among those who have had diabetes for more than five years. It may cause sensory disturbances (pain, paresthesia, loss of sensation), motor disturbances (muscle weakness), or autonomic disturbances (postural hypotension, sweating upsets, bladder and bowel malfunction). Because of the varied clinical picture, the neuropathy may be confused with other diseases, and a critical appraisal is, therefore, in order. At present, there is no therapy better than close control of the diabetes (especially in hyperglycemic neuropathies). Though at times thiamine, vitamin B_{12}, and many other preparations have been considered as successful agents, controlled studies have indicated that there is no specific therapy for the neuropathy (48, 49).

Diabetic Nephropathy

In 1936, a characteristic renal glomerular lesion found at autopsy of a small group of diabetic patients was described by Kimmelstiel and Wilson (50). Since then, diabetic glomerulosclerosis or the Kimmelstiel-Wilson lesion has become of great importance as a cause of death in long-standing diabetes. Though it is truly a pathologic diagnosis, it has been associated with a clinical syndrome. In the fully developed case, retinopathy, proteinemia, hypertension, nephrotic and/or cardiac edema, and progressive azotemia are present in a diabetic patient. Variants of this syndrome have been described by Rifkin and co-workers (51). Regardless of the presenting picture, the prognosis is poor. The average duration of life after its onset is six to seven years.

Basically the renal lesion appears to be closely related to the retinal microaneurysm (the fundamental lesion of diabetic retinopathy), and both seem to be manifestations of the same degenerative process. Work is now being done on the role of relative adrenal cortical hyperfunction possibly associated with a vitamin B_{12} deficiency as causal agents in both renal and retinal lesions (52).

There is no specific therapy for the nephropathy of diabetes. Symptomatic and supportive care alone can be offered.

Diabetic Retinopathy

Retinal capillary aneurysms are common occurrences in diabetes of long standing. These, plus the characteristic hemorrhages and exudates, are often found in conjunction with the renal lesions of diabetes mellitus (see above). They are more commonly found in long-standing diabetes and seem to be more closely related to duration of the disease rather than control. The more serious retinitis proliferans is rarer but when present often leads to blindness. There is no adequate therapy at present for either lesion.

The typical diabetic cataract tends to occur only in young patients with severe diabetes. It is rare and, if present, it is usually bilateral. There is no higher incidence of the common senile cataracts among persons with diabetes than the general population (53).

Arteriosclerotic Complications

The relationship between diabetes and arteriosclerosis is close. Post-mortem examinations plus studies on living persons with diabetes show very clearly the increased incidence of coronary artery disease, cerebrovascular disease, and peripheral vascular disease (16, 54, 55). For example, Stearns demonstrated (54) that at autopsy functionally significant coronary artery disease was found in three-fourths of the hearts of diabetic patients (as opposed to one-third of non-diabetic controls) and that one-third of these patients had died of acute coronary artery disease. Wessler and Silberg (16) found diabetes in twenty-eight of thirty patients who had major amputations of a limb for gangrene.

Despite these statistical facts, the etiology of the increased incidence of arteriosclerosis among patients with diabetes is unknown (56). The relationship of hypercholesterolemia, lipoproteins, and transport mechanisms as investigated by Gofman *et al.* (57, 58), Barr (59), and others is an exciting but as yet unfinished chapter in today's research.

SUMMARY

A brief review of current concepts in our understanding of diabetes mellitus has been presented. The many gaps in our knowledge and areas of present research have been noted. The etiology, diagnosis, and treatment are discussed in detail, and a classification of the types of diabetes and the opposing ideas of control are presented. Short-range and long-range complications and their relationship to diabetes mellitus are mentioned.

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BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

John Howland—February 3, 1873–June 20, 1926

Today rickets is rarely seen in infants, and the use of cod-liver oil and the importance of vitamin D is a familiar story. But it was only thirty-six years ago that John Howland and his co-workers at Johns Hopkins developed a method for determining calcium in small quantities of blood serum, thus making possible the analysis of babies' blood. The following year (1921), Howland published findings showing that in rickets, the calcium content of infants' blood remained at the normal level of 10 to 11 mg. per 100 cc., but that in extreme cases, the phosphorus content dropped from the normal of 5 mg. to as low as 1 mg. per 100 cc. Next (1922), it was shown that cod-liver oil increased the inorganic phosphorus of the serum, and irradiation had the same effect. Howland and Park were the first to show, by the use of X-rays, that cod-liver oil given to children with rickets produced curative results.

Howland's work on rickets was probably his greatest achievement. He saw many cases of rickets, especially in Negro children at the pediatric clinic, and he felt that he must find what caused the softness, bending, and bulging of the bones. He looked to the chemical constituents of food, blood, and bones for the answer, seeking some deficiency or imbalance. He also urged his pupils to acquire the knowledge and techniques of chemistry because he thought that the study of function rather than of structure was the key to progress.

But work on rickets was not his only contribution. John Howland began the first work in the U.S. on the metabolism of children, and his calorimetric observations on infants (1911, 1912), showed that there was close agreement between methods of direct and indirect calorimetry as observed in hourly periods. He developed an accurate formula for computing surface area of infants and showed that the respiration calorimeter gave reliable results for heat production of infants. He also showed that energy metabolism per unit of surface area is higher in infants than adults.

John Howland was born February 3, 1873, a direct descendant of the John Howland who came over in the *Mayflower*. He took his M.D. at New York University (1897) and another M.D. at Cornell (1899). In 1900, he went to Berlin and Vienna to study pathology and children's diseases and in 1902 returned to New York where he became associated with Dr Emmett L. Holt in pediatric practice. He was also pediatrician in charge of the children's clinic at Bellevue Hospital, attending physician at the Willard Park Hospital, and Associate and Instructor in Pediatrics at Columbia University.

In 1910, he went to Washington University in St. Louis as Professor of Pediatrics. In 1912, was made Professor of Pediatrics at Johns Hopkins University Medical School, and there created the first university pediatric clinic worthy of the name; and it was there that his greatest work on nutrition of children was done.

His co-workers have described him as having a winning personality; he was tender with little children and his first thought was always for the sick infant. He had an investigative spirit; a keen sense of humor; courage and the will to succeed; a hatred of inefficiency and waste; a direct, precise, and independent mind; and the ability to inspire enthusiasm, loyalty, and admiration.

Early in 1926, Howland was not well and went to Europe for a holiday, but he became ill and died in London on June 20, 1926 of cirrhosis of the liver.

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Recent Progress in Dietary Research and Dental Caries[1]

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SIX YEARS ago I suggested (1) five dietary approaches for good teeth, low in caries. If I were to rewrite that summary today, I would eliminate the use of neutral or alkaline-forming salts or foods because it has merged into the second point which was stated as: "Balance the diet carefully during the formative period of the tooth." Today, indications are that the mineral portion of the diet must be very, very carefully balanced in order to favor excellent tooth formation, maturation, and maintenance. Otherwise, that paper is in line with recent progress on the dental caries problem.

That the diet is of primary importance in sustained resistance to dental caries is accepted today as fact. The classical work of Boyd (2) with institutional children demonstrated the importance of diet in the control of caries.

Nutritive Factors in Caries Production

The status of research with respect to dental caries has now evolved itself into a first class biochemical problem. New avenues of research are presenting themselves with increasing frequency, and the factors under investigation are: (a) the influence of saliva, (b) the role of carbohydrates or sugars in the production of dental caries, (c) the effect of refined processed foods on caries susceptibility, (d) the effect of minerals and mineral balances, (e) the effect of fiber and other non-nutritive dietary additives, (f) the status of fluoridation and fluorine in the control of dental caries, and (g) vitamins. I do not propose to report research work in all of these areas; I have listed them simply to bring to your attention the many aspects of the problem.

It is necessary in the beginning of this subject to retrace our steps somewhat and ask what is the nature of the caries process. In my judgment, the bacterial theory of caries production is still valid. Experimentally induced caries with laboratory animals supports this theory. Orland *et al.* (3), Kite and others (4), and Shaw (5) have given convincing proof that dental caries production is a bacteriologic sequence. In this respect, the research of Wakeman and colleagues (6) is of importance. They were able to show that not only were lactic-acid-forming bacteria present in the decaying tooth of the cotton rat, but the main forms of microorganisms present were enterococci which have the ability to hydrolyze the proteinaceous framework of the tooth as well as to develop acid for the dissolution of the inorganic calcium salts. If the bacteriologic theory is correct, then it gives us a basis on which to proceed logically to control such activity. Hence, any condition in the oral cavity which would be conducive to supporting large numbers of microorganisms would certainly favor development of dental caries. Conversely, any factors which would tend to lessen or make the environment unfavorable for the growth of microorganisms would deter carious formation.

Role of Saliva in Controlling Caries

It is becoming increasingly evident that saliva has a significant role to play in the control of dental caries. Disturbances in the elaboration of saliva or changes in its composition affect the dental caries score. Weisberger *et al.* (7) extirpated the major portion of the salivary glands in the rat and were able to demonstrate that in the absence of saliva very severe caries developed. Thus, desalivation produced a favorable environment for microorganisms of the caries-producing type. Fanning *et al.* (8) desalivated rats of various ages and found that immediately after weaning they developed the highest incidence of carious lesions. They suggest that saliva contributes in some way to tooth maturation.

That saliva may contain secretory entities was suggested by Ryan and Kirkwood (9). They postulated that the thyroid hormone, thyroxine, was degraded by the salivary glands to the iodide ion, which in turn was responsible for the reduction of experimentally induced caries when desiccated

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thyroid was fed. Muhler and Shafer (10) have shown that desiccated thyroid had an anticariogenic effect in the rat. While this postulation of Ryan and Kirkwood needs confirmation, it does suggest that secretory substances may be present in saliva.

The importance of saliva in the production of dental caries would indicate that it has at least two possibilities: one, the water dilution and quick oral clearance, and second, the secretion of substances which would control the growth of microorganisms in the oral cavity.

That fluidity has an important effect on the development of dental caries was shown by Anderson *et al.* (11). These authors fed various dry cariogenic rations and also the same rations suspended in water. Dry whole milk and dry skim milk plus butter were found to produce a high incidence and extent of carious lesions as compared to the zero scores of their controls. When these dry milks were reconstituted with water and fed in liquid form, the caries development was reduced again to zero. Diet 802 when fed suspended in water failed to produce caries, while in the dry form it was cariogenic. Haldi and colleagues (12) showed that sugar fed in granular form or in forms which adhered to the enamel surface increased cariogenicity of the diet, but when it was fed in solution, caries were greatly reduced. Unpublished data at the University of Wisconsin shows that pectin because of its adhesive characteristics greatly enhanced the development of dental caries in the cotton rat.

Carbohydrates and Processing of Foods

One of the factors contributing greatly to the development of dental caries is the carbohydrate portion of the diet. Shaw (13) states in a summary of a decade of dental research: "Compelling evidence has been compiled with experimental animals to show that the carbohydrates in general and the mono- and the disaccharides in particular are responsible for the initiation and progression of the caries lesion. The degree of influence is closely dependent upon the form in which carbohydrate is ingested and the rate at which it is cleared in the oral cavity."

Much of our American diet is made more palatable by dextrinizing starch foods before consumption. This leads to a partial hydrolysis of the starch molecules and makes them more readily digestible and more easily degraded to the mono- and disaccharide stages. The use of bread, for example, or cooked cereals in which part of the raw starches have been converted or dextrinized accentuates the problem. The physical state of such foods also affects the caries incidence. When pectins are included in the diet, they adhere to the enamel surface and adsorb considerable amounts of fermentable sugars, thus providing an excellent covering under which microorganisms can work.

That dental caries production does not depend entirely on the sugar content *per se* of the diet is demonstrated by data reported by Wynn *et al.* (14). These workers found that two diets which were alike as far as carbohydrate content was concerned and closely similar in protein and fat composition produced in the same strain of animals two quite different results. Both diets contained 64 per cent sucrose. These experiments indicate clearly that dietary factors other than sugars are involved in many teeth with high caries scores.

The recent report by McClure and Folk (15) is of great interest. Their attention was first called to the relation of protein content of the diet to caries by heat-treated cereal foods and heat-treated skim milk powders. Additional heat further augmented the cariogenic properties of these two foods. They used two different caries-producing rations and were able to show that lysine supplements significantly reduced the smooth surface caries in the white rat. Arginine and histidine were ineffective.

Minerals and Dental Caries

Braunschneider and co-workers (16) obtained data which suggested that caries susceptibility of the normal white rat decreased as the tooth age increased. Whether this was due to the complete mineralization of the tooth or some other ionic exchange cannot be ascertained at present. Sognnaes, Shaw, and Bogoroch (17) were able to demonstrate with radioactive tracer studies that a newly erupted tooth could incorporate an inorganic ion ten to twenty times faster than in a normal adult tooth. Shaw states that the inorganic components which are being incorporated during maturation have their

TABLE 1

Effect of low calcium intake on caries scores of rats at 7 to 10 weeks of age

DIET	CALCIUM INTAKE	CARIES SCORE		INITIAL AGE
		Incidence	Extent	
	%			*wk.*
Basal (Salts IV)	0.56	5	6	3
Basal (Salts IV – calcium)	0	15	21	3

TABLE 2

Effect of age and calcium on caries scores at 11 weeks

DIET	CALCIUM INTAKE	CARIES SCORE		INITIAL AGE
		Incidence	Extent	
	%			*wk.*
Basal (Salts IV)	0	20	31	3
Basal (Salts IV)	0	10	13	6
Basal (Salts IV – calcium)	0.28	17	24	3
Basal (Salts IV – calcium)	0.28	8	9	6

TABLE 3

Effect of processing on cariogenicity of oat cereal at 14 weeks on cotton rats

DIET	CARIES SCORE	
	Incidence	Extent
CMS* (whole oats)	10	14
CMS (groats)	20	36
CMS (steamed groats)	20	37
CMS (rolled groats)	19	31

* Cereal, 50%; dried whole milk, 32%; sucrose, 18%.

origin in salivary secretions. This may be true of the enamel surface, but it would appear that the dentin not only is in contact with possible salivary secretions but also with the fluids of the tooth pulp cavity, where inorganic ions would be in an equilibrium environment.

Wynn and co-workers (14) attempted to explain the difference between the caries incidence obtained with rats fed Emory diet vs. the Harvard diet on the basis of the mineral portion of the ration. They found that the addition of aluminum to the Harvard diet did not decrease the caries incidence. The interest in minerals at Wisconsin began with the report of Constant *et al.* (18) in 1952, which showed that the level of refined sugar did not represent a reliable criterion for predicting the cariogenicity of the diet. Natural diets which consisted of dried whole milk, processed cereals, and 18 per cent sucrose were found to be more cariogenic than a partially purified diet containing 67 per cent sucrose. The data suggested that the mineral component of the diet influenced the production of caries in fully erupted teeth of the cotton rat (Tables 1 and 2). This observation was also made by Wynn *et al.* (14) in 1953 when they reported a difference in the cariogenicity of two semi-synthetic diets which contained identical amounts of sucrose. The major differences in the two diets were the composition of the mineral mixture and the vitamin supplements.

Further work has been done at Wisconsin (19) in an effort to assess the effect of certain minerals, dietary fat, tooth maturity, and processed cereals on the production of dental caries in the teeth of cotton rats. It was very apparent that a delay of one month in the feeding of the highly cariogenic basal diet resulted in a marked decrease in tooth decay. The average incidence dropped from 22 to 8 and extent from 58 to 13. Reduction in tooth decay was again observed when 4 per cent Salts IV was added to the basal diet. The lesions dropped from 22 to 10 per capita, and the extent from 58 to 18. This reduction in tooth decay caused by the several mineral supplements indicates that they influenced the development of caries in the erupted teeth of cotton rats.

The cause of the increased cariogenicity of the diets containing sucrose and processed cereals was then sought. A supply of whole oats, oats before steaming, oats after steaming, and rolled oats of the same origin were obtained. The cereal products were fed at a level of 50 per cent in the cereal-milk-sucrose diet. The caries scores of these animals showed that the increased cariogenicity of processed cereals occurred in oat products at the stage of the removal of the hulls. Animals fed unsteamed oats had 20 lesions per capita and those fed whole oats 50 per cent less, or 10 lesions per capita.

TABLE 4

Effect of oat hulls on caries scores at 14 weeks in cotton rats

DIET	CARIES SCORE	
	Incidence	Extent
CMS (oat groats)	26	49
CMS (whole oats)	17	21
CMS (1:1 groats and hulls)	13	15
CMS (groats and hull ash)	22	37

Another experiment was then made to determine whether the fibrous hulls were responsible for the reduced cariogenicity of whole oats. A supply of oats, groats, and hulls were obtained from the original source. The experimental plan was: Lot 1—groats; Lot 2—whole oats containing 25 per cent of hulls and thus supplying 12.5 per cent hulls to the ration; Lot 3—a 1-to-1 mixture of groats and hulls, approximately 25 per cent of the ration; and Lot 4—groats plus 9 per cent ash obtained from the dry ash of whole oats. The addition of ash from whole oats did not alter the cariogenicity of the groats (Tables 3 and 4). The animals fed the whole oats again had less tooth decay with incidence reduction from 26 to 17 and extent from 49 to 21. Feeding of oat hulls and a 1-to-1 mixture of groats and hulls decreased tooth decay to an average number of 13 lesions per capita with an extent of 15. Later the oat-hulls effect was shown not to be due to dilution.

To investigate the problems raised in these studies, two approaches were used: one a long-time study of the effect of maternal diet on caries susceptibility of the offspring (20), and a second series to ascertain more fully the relation of oat hulls or fibrous materials to caries resistance in young cotton rats (21).

Effect of Maternal Diet and Minerals

In these experiments semi-purified diets adequate for the cotton rat were used, and only two ingredients were varied. These were calcium to provide three levels of calcium: 0.6, 0.2, and 0.1 per cent; and protein to give two levels of protein: 30 and 15 per cent in the maternal diet (Table 5). Sufficient pairs of adult cotton rats were used to provide litter-mate weanlings for each of three dietary treatments, Cariogenic Diet 802; Diet 802 modified to contain only 0.2 per cent calcium (802-A); and Diet 802-A fed after the young rats were 59 days old. The breeding females were fed during three

TABLE 5

Experimental design

EXPERIMENTAL PERIOD	DIET		
	Group 1	Group 2	Group 3
A	30% protein, 0.6% calcium	30% protein, 0.6% calcium	30% protein, 0.6% calcium
B	30% protein, 0.2% calcium	15% protein, 0.6% calcium	15% protein, 0.2% calcium
C	30% protein, 0.1% calcium	15% protein, 0.1% calcium	15% protein, 0.1% calcium

periods to yield two litters per period from which the young were taken to place on tests for caries resistance in the three treatments mentioned above. Since the same females were used to supply offspring during each period of change in dietary regimen, heredity factors were seemingly under control.

Representative results of interest to dietitians are summarized in Table 6. It is evident that dental caries increased with the reduction of calcium from 0.56 per cent to 0.2 per cent of the diet. The outstanding results are those which sharply drop in both incidence and severity of caries due to the delayed age at which the young rats were transferred to cariogenic Diet 802-A. Those animals which were transferred at 17 days of age as against those transferred when they were 59 days old were much more susceptible to caries. In other words, the older the animal, the more resistant the teeth were to dental caries. Your attention is also called to the comparative dietary influence of the maternal vs. the effect of the diet of the weanling. In these studies, the maternal diet had little appreciable effect compared to the diet of the weanling rat.

Factor of Balance in Diet

It is interesting that the simultaneous lowering of the protein from 30 to 15 per cent and the calcium from 0.56 to 0.2 per cent not only did not increase the caries scores, but lowered them slightly. Apparently, nutritive balance was re-established at a lower plane of nutrition, thus exerting a partial protective effect against caries. If this proposal is established, it may become the first explanation for the excellent teeth so frequently associated with the heavily populated areas of the Orient. A distorted mineral balance was shown by the work of Constant *et al.* (19) to cause disabling pathology and death. The studies reported here show that Diet 802 (cariogenic) fed to weanling cotton rats caused calcinosis of the heart muscle and to some extent in the kidney and liver. When the calcium content was reduced to 0.2 per cent (Diet 802-A), calcinosis disappeared but renal damage became evident.

Constant *et al.* (18), in a study of the cariogenicity of whole vs. processed cereals, showed that the former were much less cariogenic and, in the case of oats, processing to the dehulling stage resulted in the loss of the non-cariogenicity resistance factor present in whole oats. This has led us into a variety of studies to isolate further the reason for this resistance. Was it the result of the diet's mineral content, its fiber content, its dilution effect, or its physical state? Adding the ash of oat hulls to the oatmeal cariogenic diet did not prevent caries; hence the answer was not a mineral element. Ball-milled hulls were as effective in preventing caries as coarsely ground hulls; therefore, the effectiveness against caries was not the result of its abrasive or polishing effect. Various sources of fiber and cellulose were subsequently tested with negative results. At the moment, separation and fractionation studies are in progress.

TABLE 6

Effect of maternal dietary protein concentration on caries susceptibility of offspring in Group 2

MATERNAL DIET DURING EXPERIMENTAL PERIOD	WEANLING DIET	NUMBER OF ANIMALS	CARIES SCORE	
			Incidence	Extent
30% protein, 0.6% calcium	a—802	18	26	53
	b—802-A	19	32	79
	c—802-A*	17	14	26
15% protein, 0.6% calcium	a—802	18	26	54
	b—802-A	19	31	75
	c—802-A*	13	18	28
15% protein, 0.1% calcium	a—802	10	28	63
	b—802-A	10	29	65
	c—802-A*	10	19	30

* Same as Table 5.

The results obtained in our laboratory with fibrous substances support those of Shaw (22). He found that graded, step-wise levels of Cellu-flour did not prevent caries when fed with a cariogenic diet to rats. One of his most interesting and important observations was that certain resins incorporated in the diet prevented dental caries. He was able to reduce both the incidence and severity of caries in susceptible white rats when either 10 or 20 per cent of polyvinyl acetate was incorporated in the diet.

Status of Fluorine as an Anti-Cariogenic Agent

Fluoridation continues to hold the spotlight in the eyes of the public, as far as control measures for curbing dental caries are concerned. More and more potable water supplies are being fluoridated, and it is reported that 22,093,955 people are now using fluoridated water containing from 0.9 to 1.2 p.p.m. fluorine. The facts concerning fluorine (elemental F with atomic weight of 19) have changed little since 1949. It has not been shown that fluorine is an essential element in the animal economy in amounts above those found in minute amounts in common foods. Good sound teeth have been and still are being developed without added dietary intakes of fluorides.

All species accumulate fluorine in their bones on continued exposure to it. This phenomenon occurs in animals fed ordinary foods or feeds, and the aged will have a higher skeletal fluorine content than the young of the species. The margin of safety between the anti-cariogenic level and mottling level, or a toxic level, is comparatively narrow. The toxic effects of fluorine are a result of time (period of exposure) as well as dose. Fluoridation cannot meet its proponent's claim that "it will prevent dental caries." At best, it will only *partially* reduce dental caries. Another aspect of fluoridation which has not been considered is the annual pollution of millions of gallons of water in this country each year. Fluoridation of water supplies is not the complete answer to the dental caries problem.

One interesting aspect of the problem has been developed. Howell and co-workers (23, 24) used stannous fluoride topically applied and obtained caries reduction in children amounting to 50 to 60 per cent as compared to their controls. These results are equivalent to those obtained with fluoridation, and they were immediately evident within the year.

Summary

Recent studies have shown that the rate of oral clearance is a primary factor in the control of dental caries. Further, the composition of the saliva may be of great importance in resistance to caries. While fermentable sugars are the principal dietary contributors leading to dental caries, they are not the only dietary cause. Mineral components of the diet are assuming greater importance as our information on the subject increases. Nutritive balance, especially of the mineral elements, is essential to the dietary control of caries. Tooth maturation under favorable conditions greatly favors subsequent resistance to the disease. It appears that certain anti-cariogenic factors may be present in food, or feed. From the evidence available, it must be concluded that diet plays a major role in caries control.

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Developments in Consumer Dairy Products[1]

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IN THE dairy industry today, just as in other segments of the food industry, the development of new products or improvements of present products, is proceeding at an accelerated pace. The stimulus has come from a number of sources, such as technologic advances in processing and the impact of the application of recent nutrition findings to improve the quality of the food. The ultimate objective, of course, is to increase the use of milk by placing it in forms which are more appealing to the consumer, or in forms which also fill some specific role from a functional standpoint, such as in dietetics, about which we will talk in some detail later. Because of the diversity of dairy products, it is easy to visualize the many modifications which can and are being made to produce end products with somewhat different characteristics. Since it would be an obvious impracticability to cover each and every one in this paper, we will confine ourselves to those new dairy products available at the consumer level which are distinctly different from standard items to which the public has been accustomed over the years and which show promise of having wide acceptance.

The Dairy Industry

Before doing so, let us digress to take an inclusive view of the dairy industry from the standpoint of production and consumption of milk solids and see if any noteworthy trends have developed over the past several decades. This might also furnish a clue as to what direction new product development might be anticipated to take. Because of the acknowledged exceptional nutritional qualities of milk, a great deal of effort has been exerted to increase the consumption of dairy products. How successful has this campaign been? Let us examine a few figures on production and consumption as supplied in publications of the U. S. Department of Agriculture.

In terms of total milk solids, the average annual consumption per person during the years 1925–1929 was 69 lb. In 1954, the figure stood at 74.8 lb., a 9 per cent increase—significant but not outstanding. More meaningful and striking, however, are the total consumption figures when broken down into milk fat and solids-not-fat, respectively. For example, in the 1925–29 average of the total, butterfat constituted about 31.3 lb. and nonfat solids, 37.7 lb. per capita. In 1954, butter fat constituted about 27.4 lb. and nonfat solids 47.4 lb. While the drop in milk-fat consumption might well be related to increased use of vegetable-fat table spread, the picture in regard to use of nonfat solids is not so influenced. We find here a truly amazing development. In a twenty-five- to thirty-year period, there has been a 26 per cent increase in the per capita consumption of nonfat milk solids. And, this is even more striking when we consider that in this same period of time, there has been a slight drop in the average amount of whole milk produced per capita. This is an amazing shift in the dietary of the consuming public.

As to an explanation, while several factors are undoubtedly implicated, we are deeply convinced that the growing recognition of the more important nutritive values in the nonfat fraction of milk and the application of this information by dietitians in the food prepared under their supervision as well as by food processing industries can account for a goodly portion of this change. Larger and larger amounts of the skim milk which the farmer formerly fed to his pigs after separating the cream is now being processed into food for human consumption.

Nonfat Dry Milk Solids

Returning now to the main subject of our discussion if, for convenience, we should divide the newly developed dairy products into categories for the sake of our discussion, we might list, first of all, modified milks, both fluid and dried. The item in this group which seems to have made the greatest impression in recent years on the consuming public is nonfat dry milk. While nonfat dry milk, or dried skim milk as it was formerly called, has been known

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for a long time, the achievement has been in developing a product which is acceptable to the consumer for use either as a beverage or mixed as an ingredient of a recipe. Until only a few years ago, the product available to the homemaker had very poor acceptability. It had poor flavor, was difficult to reconstitute, and often was poorly packaged. Through advanced technology and research, these difficulties have been overcome. It was not until attention was given to producing a "low-heat" product instead of the "high-heat" product predominantly used in commercial food processing that a decided increase in consumer acceptance was noted.

A few words of explanation regarding the two terms "low-heat" and "high-heat" powder may be in order. The bread industry has long been a large user of nonfat dry milk solids. The addition of nonfat dry milk to bread had been recognized as improving the physical characteristics as well as the nutritional value of the loaf. To achieve the most desirable effect, it was found necessary first to apply considerable heat to the milk, for example, by exposing the milk to a temperature in excess of 200°F. for a period of 20 to 35 min. This we term a "high-heat" product. While the added heat alters the protein, making it more suitable for bread making, it reduces its dispersibility in water and induces a noticeable cooked flavor. The cooked flavor, while entirely masked in the bread flavor, is definitely objectionable when the product is consumed by itself in reconstituted form, since the user naturally desires a product similar in flavor to fresh fluid skim milk. Since the heat-induced change in protein structure was not deemed to be a necessary feature of a product for use as a beverage, it seemed reasonable to subject the liquid skim milk to the minimum amount of heat which would achieve pasteurization and produce a more palatable product. Experience has proved this to be the case; therefore, the newer nonfat dry milks in consumer packages are made by the "low-heat" process. Application of the minimum amount of heat to the product was one of the major changes in processing resulting in the products now available that have a flavor on reconstitution resembling fresh skim milk.

The next significant change was the needed improvement in solubility, which resulted in the production of the so-called "instant" nonfat dry milks now on the market. The incorporation of the instant feature into the product is largely one of a change in physical characteristics with alteration in the degree of hydration of the alpha lactose also playing some part. The net result is one of greatly increasing the dispersibility and wettability of the individual particles, thereby presenting a greater surface area for more rapid dissolution. It should be made very clear that nothing is added to the product to achieve the instant solubility. Any additives would be in violation of federal standards for this product and would render the product adulterated within the meaning of the Food, Drug and Cosmetic Act. As to the performance of the instant product, it behaves comparably in recipes with the previous product and, because "instantizing" of the product is wholly a physical change, the nutritive values remain unaltered.

To illustrate what effect these improvements have had on the consumer acceptance of this product, we might quote the following figures. In 1948, from an almost negligible figure of approximately 2 million lb. purchased by homemakers, sales have increased to a figure estimated to be in excess of 100 million lb. in 1954. In addition to looking merely at sales, I think it is also well for us to consider what this product contributes to the American dietary. It consists of whole milk from which only the cream and water have been removed, thus retaining all the proteins, minerals, and B vitamins. With our present-day mode of living, necessitating a lower daily caloric intake yet requiring a high level of protective foods, it is immediately apparent that nonfat dry milk fits admirably into the desired pattern of present-day food intake. In spite of the ready availability of fluid milk which most of us take for granted, there are still areas in this country where the intake of milk solids is woefully below the national average, and even more so, below the recommended intake. The reasons for this are the lack of adequate supplies as well as economic factors. The availability of the new nonfat dry milk solids overcomes these difficulties. It makes milk nutrients obtainable in areas where the milk supply was previously limited, or where budgetary limitations are such as to place a generous supply of milk nutrients out of reach of a significant share of the homes.

With proper care being taken in packaging, the shelf life has been extended and the retention of nutrients is excellent. The product can be reconstituted for use as a beverage or added to other foods, either in the dry form or as a liquid. Thus, it can be used to improve the quality of the diet in a variety of ways. From the standpoint of the dietitian, we truly believe it to be one of the most flexible food items available to achieve higher levels of essential nutrients in the normal diet as well as a means of providing extra amounts of these nutrients in therapeutic diets. It can fit well into diets of all groups of individuals, from infants to senior citizens. And last, but not least, it is the most economical source of high quality proteins available today. In this product, the dairy industry has made one of its greatest contributions, namely, providing a ready means of achieving the well-balanced diet for which you and your profession are striving.

Modified Fluid Milks

What are some of the other new dairy products which can be mentioned? Again, in line with the

dietary trend of our times, modified fluid milks are gaining wide acceptance. A number of products are being marketed in which the butterfat has been reduced to varying extents, ranging from a level of 2 per cent down to 0.5 per cent butterfat content. One of the most popular is a product with the fat at a level of 2 per cent and the nonfat solids increased from a range of 8.5 or 9 per cent up to 10 or 11 per cent. Again, this represents an effort to increase the level of the protective nutrients in our food and to effect a reduction in fats which contribute largely calories.

Other modifications which we might mention in this same category of products are ordinary skim milks, in which the nonfat solids have been increased by 2 per cent and fortified with additional vitamins. At the other end of the scale, while it may be difficult to believe, there are individuals in this country, though few in number, who need extra calories and experience difficulty in obtaining them from their normal diets. For this group, a high-calorie fluid milk has been prepared consisting of whole milk with increased nonfat milk solids.

Another product which is becoming more prevalent as a source of fluid milk is the three-to-one concentrate in which three volumes of milk are reduced to one volume. The chief features of this product are saving of storage space and lower cost, the latter depending on marketing conditions. Because of the higher concentration of milk solids, additional applications may be found, in cases where the greater water content of fluid milk may limit its use. Milk solids content of recipes or special dietary preparations and beverages can be increased by using this concentrate.

Still another product which has recently received considerable publicity is a low-sodium fluid milk. By treating the fluid milk with a special ion-exchange process, about 90 per cent of the sodium is removed. Such milk is particularly useful for those individuals who have been placed on a low-sodium diet because of certain heart ailments, hypertension, or kidney disorders. It is presently being manufactured in metropolitan centers by a limited number of dairies under franchise, and distributed on a home-delivery basis. To prevent its use as "a cure-all for persons with heart conditions," it is available only on a doctor's prescription and is withheld from grocery counters. It retails for approximately 50 cents per quart. It should be mentioned that the ion-exchange treatment as presently used is not without effect on other milk nutrients. The calcium level is slightly reduced and thiamine and riboflavin are removed to the extent of 50 per cent according to reports. Other nutrients, as well as flavor, apparently, are largely unchanged.

Mention should also be made of sterile canned whole milk. Again, while not a new product, improvements have been made in processing to make it more nearly resemble fresh fluid milk in flavor. At this time, the flavor difference has still not been completely overcome and consumers can generally differentiate the canned product from the fresh. And, there is no price advantage over fresh fluid milk. Increased consumer acceptance of canned whole milk must, therefore, await a product which will compare favorably in price and flavor to fresh milk. In areas where fresh milk supplies are limited or unavailable, this product may fill a need.

Other Dairy Products

Of some convenience is a powdered dairy product for use in creaming coffee which has been on the market for a relatively short time. It resembles dry whole milk in composition, and the protein has been modified so as to permit its addition to hot beverages without curdling which occasionally happens when using dry milks.

With respect now to other categories of dairy products, a new dairy spread has been developed and is available in certain localities as a substitute for butter or margarine. It contains about one-quarter the butterfat found in butter and an increased amount of nonfat milk solids, with the remaining portion present as moisture. Again, it is in keeping with the trend toward dairy products with a lower caloric level, but making a greater contribution of essential nutrients to our intake of protective foods. The product has been flavored to simulate butter and is priced about halfway between butter and margarine. It is too early to predict the success of the item or how great the consumer appeal will be. Adequate taste appeal, economical cost, and appreciation by the consumer of its greater over-all nutritional value may some day make it a strong contender as a replacement for other types of spreads.

Frozen Dairy Products

The story would not be complete if mention were not made of some of the recent developments in the field of frozen products. Ice cream has long been accepted as a standard frozen dessert. In recent years, an interesting transition has been taking place at an ever-increasing pace—the appearance of low-fat frozen desserts. Instead of 8 to 14 per cent fat as in ice cream, the new product contains 4 to 6 per cent butterfat. To compensate for the effect on texture of the reduction in butterfat, increased amounts of nonfat solids are added. Here again, the newer products are more nutritious, having a higher protein, mineral, and B-vitamin content. To illustrate the impact this product has had in a short time, we need only recall the numerous soft-serve ice cream stands which now populate our towns. One beneficial factor which we must not overlook is that the product is considerably cheaper than ice cream and what youngster—or oldster—is going to quibble over a

few per cent of fat if the refreshment value is comparable to ice cream but the cost is less?

A misnomer sometimes applied to this product is "dietetic ice cream." We are sure that this designation was not nurtured by your profession, but resulted merely from awareness by some individuals that it differed from regular ice cream and contained a higher level of some essential nutrients. If the same reasoning were followed in other lines of food, any product which was enriched nutritionally over a former one would be entitled to be called "dietetic." There are, however, new products which more nearly fit the term "dietetic," for example, high-protein ice cream, which is now appearing on the market.

Still in the field of frozen desserts, yet another group of products which has had good consumer acceptance are the "filled" ice creams or "mellorines" as they have been designated by certain state legislative bodies. They represent products in which the butterfat has been replaced with vegetable fats. No attempt shall be made here to discuss the legal aspects of this product other than to say that its sale is prohibited in certain states. In areas where it is legal, it has experienced rapid growth in sales primarily because it is cheaper than ice cream.

Future Developments

While the products discussed here are those which are now actually on the market, it can be indicated with a great deal of surety that these are only the forerunners of a larger number of other dairy products now in the development stage which hold great promise. Two general classes which may be playing a significant role in the not too distant future are: frozen milk concentrates and aseptically canned milk produced by a technique which may lead to new milk products as contrasted with those now processed in the can. Last but not least, the application of ion irradiation presages dairy products with new properties and characteristics. With the substantial upsurge in new products in every other segment of the food industry, the dairy industry must needs be "on the ball" to keep pace.

In summary, if we examine as a group the new dairy products mentioned here, it is with somewhat of a surprise that we note that they have a great deal in common and that they fit into a general pattern. Almost without exception, we can say that they embody a higher level of essential nutrients, while at the same time incorporating a high degree of palatability without which consumer acceptance cannot be obtained. They are the type of products which can be most helpful to the dietitian in practicing her profession. Truly, it can be said that the impact of advancing nutritional knowledge and recognition of the importance thereof, not only to but also by the consumer have been so great that these trends have become the controlling factors in the development of new food products which are offered to the public.

We are happy to say that the dairy industry was early to recognize this great transition. This is aptly illustrated by figures already presented which show that in spite of an increase over the past two decades of only 9 per cent in per capita consumption of total product, the increase in per capita consumption of the milk nutrients essential for growth and health during the same period was more than 25 per cent. This startling change may provide assurance that the dairy products of the future will offer you in the dietetic profession the tools with which to achieve improved health, not only in malnourished individuals but in the health of each and every citizen.

Steam Cleaning Kitchen Equipment

Steam cleaning of kitchen equipment at the University of Wisconsin Residence Halls has been in operation a little over three years. At the Klenzade Eighteenth Educational Seminar in French Lick, Indiana, last year, Otto Manthei, Sanitation Supervisor, reported the results of this method.

A portable hydro-steam cleaner and a heavy duty vacuum wet pick-up are used. This equipment is adaptable in almost any installation if a steam line with a minimum of 60 lb. pressure is available.

For the four large kitchens in the Division of Residence Halls, only one portable steam cleaner has been necessary. After the cleaning operation is completed in one kitchen, the equipment is disconnected for use in another.

With this equipment, kitchen employees do not mind the work of cleaning ranges and hoods which project over stoves, subveyors in dishrooms, under stoves, and other hard-to-get-at places—tasks which were formerly greatly disliked.

To regularize the cleaning procedures, specific training in the work is given, and only those employees so trained are allowed to do the cleaning. Even then, Mr. Manthei reports, it is difficult to remember all the points and steps in the operation of the steam cleaning when you use the equipment only occasionally. To alleviate this hazard, a "Job Breakdown Sheet" has been prepared and is given to each person authorized to do the cleaning. In it, the proper steps for operating the cleaning are outlined and key points to remember are emphasized. The purpose of this job breakdown sheet is to emphasize to the operator the importance of safety as well as the proper operation of the equipment.

Ascorbic Acid and Color Retention in Green Beans Cooked by Different Methods[1]

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STUDIES reported by Noble (1) and Noble and Hanig (2) have shown in a number of vegetables that losses of ascorbic acid are greater in samples cooked in a fairly large amount of boiling water than in those cooked by essentially steaming methods, such as in a tightly covered kettle or steamer. However, the color of cabbage cooked in boiling water was as green or slightly greener than that of samples cooked by any of the three steaming methods. In both studies, the need for several cookings to serve as a basis for rating methods was emphasized as a consequence of the variability among replicate cookings.

The present paper reports the effect of four commonly used methods of cooking on the retention of ascorbic acid and color in several varieties of green beans.

Method

Varieties and Sources of Green Beans. Ten varieties of green beans were used: Tendergreen, Stringless Greenpod, Plentiful, New Tender Stringless, Logan, Longreen, Asgrow Stringless Wonder, Streamliner, New Keystonian, and Florida Belle. All were grown under the supervision of the Horticulture Department on University plots. They were harvested at optimum maturity and brought immediately to the laboratory, where they were processed as rapidly as possible. During the intervening period, they were kept in a refrigerator at 5°C.

Preparation and Cooking of Samples. After the beans had been washed and wiped free of surface moisture, each lot was divided according to size and general appearance into as many similar portions as were needed. Preliminary cookings were made to determine the cooking times; then the beans from one portion after another were snipped free of their ends, broken into 1-in. lengths, and well mixed. A 25- and a 230-gm. sample, or a 30-gm. and a 225-gm. sample, were weighed from each portion. The smaller sample was tied into a loose cheesecloth bag and cooked along with the corresponding larger sample by one of the following methods: boiling in an open saucepan in enough water to cover during all of the cooking period (900 ml.); cooking in a tightly covered saucepan in just enough water to prevent scorching (90 ml.); cooking on a rack above the water level in a pressure saucepan at 15 lb. pressure; and steaming. The cooking periods were the minimum which made the vegetable tender. The average times varied from 15 to 26 min. in boiling water, 25 to 30 min. in the tightly covered pan, 2.25 to 6.25 min. in the pressure saucepan, and 30 to 47 min. in the steamer.

The samples were drained and the contents of the bags emptied immediately into Waring Blendors containing 3 per cent metaphosphoric acid. A portion of each cooking water was cooled quickly in ice water.

Four replicate series of cookings were run on each variety except the New Tender Stringless and Stringless Greenpod, for each of which there were eight replicates.

Method of Analysis. The ascorbic acid contents of the cooked samples, of 25- or 30-gm. raw samples blended in 3 per cent metaphosphoric acid, and of aliquots of cooking waters were determined by the Morell (3) modification of the Bessey (4) method, except that the Bessey correction for color and turbidity was retained. Moisture was determined by the differences in weight of 10-gm. samples before and after drying for 18 hr. in a vacuum oven at 95°C. and 25 in. mercury. Color was determined by the Nickerson (5) whirling disc method.

The data for the percentage retentions in each series of four separate cookings were combined in a single analysis of variance according to Cochran and Cox (6). The means were further analyzed by the method of Tukey (7).

Results

The ascorbic acid content of the raw green beans is given in Table 1. These values, which lie between 12.0 and 22.0 mg. ascorbic acid per 100 gm. vegetable, are within the same range as the majority of values quoted by Booher, Hartzler, and Hewston (8). Their average, 16.5 mg. per 100 gm., is lower,

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however, than that given for 19 varieties of bush snap beans by Heinze *et al.*, 25.7 mg. per 100 gm. (9), and for 171 varieties and strains by Hayden, Heinze, and Wade, 20.3 mg. per 100 gm. (10).

The percentage retentions of ascorbic acid are given in Table 2. An examination of the individual values shows the inadvisability of ranking the different methods of cooking with respect to ascorbic acid retention on the basis of only one series of cookings, as has been done frequently in the past. For example, the figures for the second replicate of Logan beans seem to indicate the greatest retention of ascorbic acid in the sample cooked in the steamer and successively lower retentions in the samples cooked in the tightly covered pan, the boiling water, and the pressure saucepan. None of the other replicates, however, agree with this ranking. Similar inconsistencies are shown by the values for the other varieties.

For subsequent comparisons, therefore, the data in Table 2 were combined in a single analysis of variance since a preliminary analysis according to Cochran and Cox (6) indicated that neither the F value for variety nor the F value for variety × method-of-cooking interaction were significant at the 5 per cent level when tested against a pooled error mean square.

The mean percentage of ascorbic acid retained in green beans cooked in boiling water amounted to 60 per cent of that in the raw sample. This was significantly lower than that retained during cooking by any of the other three methods.

There were no differences among the mean percentages of ascorbic acid which were retained in green beans cooked in the tightly covered kettle, pressure saucepan, or steamer when the means were analyzed according to the method of Tukey (7). Ascorbic acid retention during cooking by these methods, all of which are essentially steaming methods, was approximately three-fourths of the original ascorbic acid content.

TABLE 1

*Ascorbic acid content of raw green beans**

VARIETY	MEAN ASCORBIC ACID	STANDARD ERROR OF MEAN
	mg./100 gm.	*mg./100 gm.*
Tendergreen	14.1	2.4
Plentiful	16.7	3.5
New Tender Stringless	16.4	1.3
Stringless Greenpod	12.9	1.3
Logan	12.0	1.6
Longreen	15.8	1.2
Asgrow Stringless Wonder	22.0	2.5
Streamliner	20.9	1.9
New Keystonian	14.8	2.2
Florida Belle	18.6	0.8

* Mean of nine determinations for the New Tender Stringless variety, eight for the Stringless Greenpod, and four for each of the other varieties.

TABLE 2

Retention of ascorbic acid in green beans during cooking by different methods

VARIETY	REPLICATE NUMBER	ASCORBIC ACID RETAINED IN VEGETABLE			
		Boiling water	Tightly covered pan	Pressure saucepan	Steamer
		%	%	%	%
Tendergreen	1	60	86	64	72
	2	55	96	77	85
	3	56	68	68	88
	4	57	50	71	76
Plentiful	1	52	60	60	71
	2	50	39	59	33
	3	54	69	80	79
	4	48	76	62	75
New Tender Stringless	1	44	53	58	—
	2	41	88	57	66
	3	60	91	93	89
	4	70	70	82	72
	5	62	69	66	58
	6	50	58	66	57
	7	68	45	92	92
	8	67	90	84	71
Stringless Greenpod	1	73	103	70	107
	2	62	96	70	54
	3	70	83	67	46
	4	65	59	77	90
	5	74	82	90	92
	6	72	77	78	81
	7	57	45	73	38
	8	57	66	83	91
Logan	1	80	75	86	84
	2	63	66	58	72
	3	78	54	68	85
	4	73	68	73	93
Longreen	1	53	77	85	71
	2	54	67	92	62
	3	60	95	91	91
	4	44	75	87	80
Asgrow Stringless Wonder	1	66	92	93	86
	2	51	71	75	76
	3	60	79	78	79
	4	47	78	70	85
Streamliner	1	53	73	82	70
	2	60	67	76	83
	3	63	68	72	86
	4	62	43	72	80
New Keystonian	1	57	74	68	79
	2	70	44	85	52
	3	57	56	94	75
	4	81	68	62	99
Florida Belle	1	59	84	90	80
	2	66	73	88	94
	3	56	71	69	85
	4	40	75	62	84
Mean		60	71	76	76

TABLE 3

Hue, brilliance, and chroma of green beans cooked by different methods

VARIETY	COLOR EVALUATION				
	Raw	Boiling water	Tightly covered pan	Pressure saucepan	Steamer
Hue*					
New Tender Stringless	34.0	31.9	30.2	32.8	30.0
Longreen	35.6	32.6	29.2	34.5	26.1
Streamliner	35.1	31.6	27.2	33.5	26.8
New Keystonian	35.0	31.8	29.8	34.0	26.2
Florida Belle	34.9	32.5	27.6	33.1	25.9
Brilliance*					
New Tender Stringless	5.6	4.1	4.3	4.1	4.5
Longreen	5.7	3.4	3.5	3.7	3.4
Streamliner	5.4	3.8	3.5	3.9	3.6
New Keystonian	5.0	3.7	3.4	3.9	3.7
Florida Belle	4.9	3.7	3.9	4.2	3.8
Chroma*					
Giant Stringless Greenpod	—	2.3	—	2.0	2.2
Giant Stringless Greenpod	—	3.3	—	4.3	2.4
New Tender Stringless	6.2	3.1	3.3	3.2	3.6
Longreen	6.6	2.1	1.9	2.6	1.6
Streamliner	6.0	2.5	1.9	2.9	2.0
New Keystonian	5.2	2.4	2.0	2.9	2.1
Florida Belle	6.1	2.9	2.3	3.3	2.0

* According to Munsell notation (5). By this notation, hue values between 36 and 31 represent gradations of yellow-green toward yellow, and values of 30 to 25 represent yellow. Brilliance values are expressed on a scale of 0 (black) to 10 (white); chroma values on a scale of 0 (neutral grey) to 7 (greatest possible color strength).

The pattern of retention shown by the green beans is similar to that for cabbage, rutabagas, peas, and asparagus reported by Noble and Hanig (2) and for the majority of cabbage samples reported by Noble (1).

The difference between the boiled and steamed samples in ascorbic acid retention produces less difference in the proportion of the recommended allowance furnished by one serving than might be anticipated from the percentage retention figures. Thus, on the basis of beans containing 16.3 mg. ascorbic acid per gram of raw vegetable, a 64-gm. serving (½ cup) of beans cooked in boiling water would furnish 8.3 per cent of the daily ascorbic acid allowance, while the same quantity of beans cooked by any of the other methods would furnish 10.3 per cent.

The amounts of ascorbic acid dissolved in the cooking waters, although not too important from a practical dietary standpoint since large amounts of cooking water are rarely utilized, give interesting indications of the partition of ascorbic acid between the cooked vegetable and cooking liquid and the unaccounted portion. The average percentage of the original ascorbic acid content dissolved in the cooking water from the open kettle was 13; that from the tightly covered kettle, 4; that from the pressure saucepan, 3; and that from the steamer, 2. Despite the differences among the four methods in the amounts of ascorbic acid retained in the vegetable and in the cooking liquid, ascorbic acid retained in the combined vegetable and cooking water was essentially the same in the four methods.

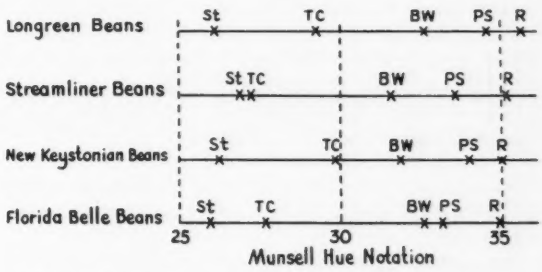

FIG. 1. *Average hue, as shown on Munsell color scale, of five varieties of green beans before and after cooking.* LEGEND: st = *steamer;* tc = *tightly covered kettle;* bw = *boiling water;* ps = *pressure sauce pan;* r = *raw.*

The color data which serve as an important objective measure of the attractiveness of green vegetables are summarized in Table 3 and shown graphically in Figure 1. The changes in hue were consistent for all varieties. In every case, the color of beans cooked in boiling water or the pressure saucepan was most nearly that of the raw vegetable. The beans cooked in the pressure saucepan were greener than the beans cooked in boiling water. Those cooked in either the steamer or tightly covered saucepan, on the other hand, were a pronounced yellow and showed little of the green of the raw vegetable. Neither brilliance (lightness or darkness) nor chroma (intensity) of beans were affected significantly by the method of cooking. Generally, the raw vegetable possessed the highest brilliance (that is, was the lightest), but none of the samples varied greatly from one another. Similarly, the raw beans were stronger in chroma than the cooked samples, among which there were no consistent differences.

These results suggest that the pressure saucepan is superior to other cooking methods from the standpoint of retention of both color and ascorbic acid and that the tightly covered saucepan and steamer methods, although superior to the boiling water method in retention of ascorbic acid, are less satisfactory from the standpoint of color retention.

Summary

The effect of four common household methods of cooking on the ascorbic acid content and color of green beans has been determined. The cooking methods were: boiling in an open saucepan in enough

water to cover during the entire cooking period; cooking in a tightly covered saucepan in just enough water to prevent scorching; cooking in a pressure saucepan at 15 lb. pressure; and steaming.

The average ascorbic acid content of the raw beans was 16.5 mg. per 100 gm. vegetable.

The retention of ascorbic acid varied sufficiently from one replicate to another to show that one series of cookings is inadequate for judging the relative effectiveness of the different methods of cooking.

Statistical analysis of the data showed that the samples cooked in boiling water retained significantly less ascorbic acid than did those cooked by the other three methods, none of which were significantly different from one another. The samples cooked in boiling water retained an average of 60 per cent of the ascorbic acid in the raw vegetable and those cooked by the other methods an average of 74 per cent.

The color of the beans cooked in boiling water or in the pressure saucepan was almost as green as that of the raw vegetable, while the color of the samples cooked in the tightly covered pan or steamer was yellow.

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Emergency Pantry for 100-Bed Hospital

Dietitians of the Washington State Dietetic Association have worked out, at the request of the state Civil Defense Office, a plan for basic food needs for a 100-bed general hospital in an emergency. Recommendations were made to include staff, volunteers, ambulance drivers, and so on. The recommendations follow:

EMERGENCY MINIMAL RECOMMENDATIONS PER DAY

	Per person	*100 persons*
Milk		
Fresh, or	¾ qt.	75 qt.
Evaporated, or	1 can	2 cases
Dried	¾ qt. reconstituted	15 lb.
Cereals		
Farina, Cream of Wheat, Rice Krispies, Kix, Cheerios, Corn Flakes	½ lb.	50 lb.
Bread, crackers	½ lb.	50 lb.
Stew, canned, or soup (includes foods such as spaghetti and meat balls, chili, navy beans, canned stew, canned meats, or substitute fresh ingredients)	½ lb.	50 lb.
Coffee	6 c.	3 cases individual servings
Instant, or	1½ oz.	
Regular	2 oz.	12 lb.
Salt		1 lb.
Sugar (if available—substitutes or extras)		10 lb.
Cheese, canned meat, peanut butter, canned fish, eggs, poultry	⅛ lb.	25 lb.
Canned fruit juice	½ lb.	1½ cases or 12/46 oz.
Potatoes	3½ to 4 oz.	15–18 lb.
Vegetables, fresh (carrots, etc.)	3 oz.	15 lb.
Paper hot cups (if available)		350
Spoons (if available)		

Acceptability of Irradiated Foods

Dietary Procedures[1]

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SINCE the advent of the atomic age, many scientists have devoted their attention to peaceful uses of this new energy source. One such program has been the development of a technique to sterilize food by use of the radiations from radioactive isotopes. The mechanics of this operation have been described in publications elsewhere (1–3).

To test whether irradiated foods are safe for human consumption, toxicity studies have been in progress at the Army Medical Nutrition Laboratory. These studies were first conducted on animals (4–6) and have now been extended to human subjects. This paper presents the dietary procedures used in an irradiated food balance study. The subjects participating in these studies are conscientious objectors who thereby fulfill their military service obligations.

Experimental Procedure

Nine subjects were placed on two fifteen-day regimens consisting of three days of pre-feeding and two six-day balance periods. Three daily menus (see box) were fed in rotation. During the first fifteen-day period, four subjects ate the diet containing irradiated food, while the remaining five were on the same diet containing non-irradiated, control food. This pattern was reversed during the second fifteen-day balance period. On the irradiated food diet, which averaged 3160 calories per day, approximately 35 per cent of the calories were irradiated. The irradiated foods on this study were: peaches, strawberries, ground beef, ground ham, ground bacon, haddock, green beans, beets, cereal bar, bread, and powdered milk.

A second four-day study was used to test only the acceptability of additional irradiated foods: whole kernel corn, ham steaks, and tenderloin steaks. These items could not be incorporated into a balance study due to the difficulty encountered in fecal analysis with the corn and the impossibility of obtaining steaks of the same caloric content because of variability of fat distribution. During the first and last three days of each fifteen-day period, the subjects also filled out acceptability questionnaires at every meal stating the desirability of each item on the menu (Table 1).

Procurement and Processing of Food

All irradiated and control foods, which constituted the 35 per cent of the diet noted above, were ordered through the Quartermaster Food and Container Institute for the Armed Forces, Chicago, with specific instructions for the processing so that the food could be utilized on a balance study. Meats were ground twice and the entire batch mixed thoroughly in a large mixing machine to insure homogeneity. All fruits, vegetables, and cereal products were purchased from the same lot number of one processor.

Food items were placed in No. 2 and No. 10 cans, and each can of each individual food was numbered consecutively from one. All odd-numbered cans were shipped frozen by air freight to Dugway, Utah, and Arco, Idaho, to be irradiated at a sterilizing dose of 3×10^6 rep. Irradiation was obtained with mixed fission products (essentially a gamma ray source). The even-numbered control cans were shipped in the frozen state directly to the Medical Nutrition Laboratory in Denver.

The food of the remaining 65 per cent of the diet was purchased through the post commissary, using the specifications mentioned above. All food, except for milk and regular bread, was purchased and stored before the study began. As time is a pertinent factor while conducting a balance study, every at-

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[2] The authors are indebted to the nine conscientious objectors who served as experimental subjects on this project; to SP3 Edward Ayer and SP3 Roy Bomar who served as cooks; to Dr. Norman F. Witt, Principal Investigator under contract DA-49-007-MD-549 between the University of Colorado and The Office of the Surgeon General, Department of the Army; and to Dr. Herman F. Kraybill, Chief, Chemistry Division, Medical Nutrition Laboratory. The views expressed in this paper are those of the authors and are not necessarily opinions of the Department of the Army.

Menus served during study of acceptability of irradiated foods

MENU 1	MENU 2	MENU 3
	Breakfast	
Frozen peaches*	Tomato juice	Frozen orange juice
Cereal bar*	Rice Krispies	Cereal bar*
Fried eggs	Scrambled eggs with ground bacon*	Fried eggs
Toast*	Toast*	Toast*
Butter	Butter	Butter
Grape jelly	Apple jelly	Currant jelly
Milk	Milk	Milk
Coffee or tea	Coffee or tea	Coffee or tea
	Noon Meal	
Broiled beef patties*	Roast turkey (white meat)	Baked ham loaf*
Catsup	Cranberry jelly	Sweet potatoes
Steamed potatoes	Steamed noodles	Lima beans
Beets*	Green beans*	Bread*
Bread*	Bread*	Butter
Butter	Butter	Frozen strawberries* in Jello
Vanilla ice cream	Frozen peaches*	Cocoa*
Cocoa*	Cocoa*	Coffee or tea
Coffee or tea	Coffee or tea	
	Evening Meal	
Roast turkey (white meat)	Broiled beef patties*	Baked haddock*
Cranberry jelly	Catsup	Steamed potatoes
Steamed potatoes	Steamed potatoes	Peas
Green beans*	Carrots	Bread
Bread	Hamburger buns	Butter
Butter	Butter	Canned pears
Frozen strawberries* in Jello	Vanilla ice cream	Milk
Vanilla	Cocoa*	Coffee or tea
Milk	Coffee or tea	
Coffee or tea		
	8 P.M. Snack	
Canned pineapple chunks	Canned apricots	Canned applesauce
Graham crackers	Lorna Doone cookies	Angel food cake
Milk	Milk	Milk

*Irradiated.

tempt was made to have a major portion of the food weighed before the study began.

Preparation of Food

Meat, Fish, Poultry. Meat, fish, and poultry were thawed overnight to allow weighing in a thawed state before cooking. Beef patties were cooked in covered, individual frying pans. Ground bacon was weighed before the study began, wrapped in Saran wrap, and refrozen, until time of use. Bacon was also cooked in the covered, individual frying pans. To utilize the fat from the bacon, a 100-gm. portion of raw eggs was added to the cooked bacon and bacon fat and scrambled.

Turkey, haddock, and ground ham were weighed into individual casseroles and baked in the oven. The ham was covered with bread crumbs, the latter having been weighed in individual packages prior to the study.

The turkey, ham, and haddock were all baked at 325°F., the turkey and ham for 60 min., and the haddock for 30 min.

Vegetables. All vegetables were steamed in individual casseroles in a pressure cooker at 9 lb. pressure. Potatoes and carrots were steamed 45 min.; frozen green beans and beets, 30 min.; and, canned peas, sweet potatoes, and Lima beans, 10 min.[3]

Fruits. Peaches were thawed, drained into colanders, and the solid fruit was weighed into waxed paper cups and refrozen.

Strawberries were handled the same way, except that 70 gm. solid and 30 gm. juice were used to make up the 100-gm. portions. Because irradiation results in a decided color difference in strawberries (irradiated strawberries were pale pink as contrasted with the bright red control strawberries), they were served in strawberry gelatin to which carmine was added to obscure the color differences.

Canned pineapple chunks, pears, and apricots were drained before weighing.

Bread, Cakes, Cereal, and Cookies. Bread was weighed approximately once a week, wrapped in Saran wrap, and frozen until time of use. Angel food cake was handled in the same way, except that the entire batch was wrapped before the study began.

[3] Although these cooking times seem excessive for vegetable preparation, they were necessitated by the altitude and equipment used.

TABLE 1

*Tabulation, indicating average relative acceptability by nine subjects of control and irradiated food items**

Legend: ratings of control foods are indicated by *italic type*; those for irradiated foods appear in **bold face** type; where ratings for both control and irradiated foods were similar, rating appears in ***bold face italic*** type.

Beef, ground	Like extremely	Like very much	Like moderately	***Like slightly***	Neither like nor dislike	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Ham, ground	Like extremely	Like very much	Like moderately	Like slightly	***Neither like nor dislike***	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Bacon, ground	Like extremely	Like very much	***Like moderately***	Like slightly	Neither like nor dislike	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Haddock	Like extremely	Like very much	Like moderately	Like slightly	**Neither like nor dislike**	*Dislike slightly*	Dislike moderately	Dislike very much	Dislike extremely
Peaches	Like extremely	Like very much	***Like moderately***	Like slightly	Neither like nor dislike	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Strawberries	Like extremely	Like very much	Like moderately	*Like slightly*	**Neither like nor dislike**	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Green beans	Like extremely	Like very much	Like moderately	Like slightly	*Neither like nor dislike*	**Dislike slightly**	Dislike moderately	Dislike very much	Dislike extremely
Beets	Like extremely	Like very much	Like moderately	Like slightly	Neither like nor dislike	*Dislike slightly*	**Dislike moderately**	Dislike very much	Dislike extremely
Cereal bar	Like extremely	Like very much	Like moderately	***Like slightly***	Neither like nor dislike	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Bread	Like extremely	Like very much	Like moderately	***Like slightly***	Neither like nor dislike	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Milk, powdered	Like extremely	Like very much	Like moderately	*Like slightly*	**Neither like nor dislike**	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Tenderloin steaks	Like extremely	Like very much	Like moderately	***Like slightly***	Neither like nor dislike	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Ham steaks	Like extremely	Like very much	*Like moderately*	**Like slightly**	Neither like nor dislike	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
Corn, whole kernel	Like extremely	Like very much	Like moderately	Like slightly	*Neither like nor dislike*	**Dislike slightly**	Dislike moderately	Dislike very much	Dislike extremely
Bacon, sliced	Like extremely	Like very much	***Like moderately***	Like slightly	Neither like nor dislike	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely

* Hedonic scale used by Acceptibility Division of the Quartermaster Food and Container Institute for the Armed Forces.

Cereals were weighed the night before serving. Cookies, Graham crackers, and noodles were weighed into sandwich bags, stapled shut, and placed in large tin containers with covers until time of use. To each gram of noodles, 4 gm. water were added prior to cooking. Noodles were cooked in individual casseroles in a pressure cooker for 15 min.

Dairy Products. Butter was weighed in 5- and 10-gm. portions, wrapped in Saran wrap, and frozen before the study began. Powdered milk was weighed into small paper envelopes.

Due to a bitter flavor observed with irradiated powdered whole milk, it was necessary to serve it as a cocoa beverage. The weighed sugar, cocoa, and powdered whole milk were placed in individual metal tea pots and thoroughly mixed with a cup of boiling water. Cocoa was kept hot in a water bath until serving time.

Regular whole milk was weighed shortly before serving time.

Vanilla ice cream was weighed into waxed paper cups, then covered with lids, and retained frozen during the study.

Serving Procedures

To facilitate the serving of irradiated and control food, the following procedures were adopted:

Subjects eating irradiated food were given tray name tags with odd numbers, while those on control food received even numbered tags. The irradiated and control food containers served the subjects were also numbered odd and even. To prevent any discovery of the code system by the subjects, regular food items were also numbered at random with both odd and even numbers.

Foods were weighed raw on scales measuring to 0.1 gm. Whenever possible, foods were weighed directly into the container in which they were served, thus requiring as little transfer as possible. Foods were served in frying pans, casseroles, and paper containers.

Subjects were given specific instructions in procedures to be used in cleaning their dishes. Dishes were literally licked clean, glasses rinsed with water and the washings drunk.

Had any food been returned on trays, it would have been weighed and sent to the laboratory for chemical analysis. However, having a most conscientious group of subjects who followed instructions carefully and cleaned plates thoroughly, no weigh backs were needed.

Calculations

Calculations on this study were made from published tabular values (7–9), from the Atwater general (10) and specific systems (11) as applied to the Medical Nutrition Laboratory chemical analyses, and by bomb calorimeter balance method (12).

Each item was analyzed chemically for protein, fat, and calories; carbohydrate values were obtained by difference. Figures were obtained for both irradiated and control foods. The protein content was derived by multiplying the Kjeldahl nitrogen value by the appropriate factor (13).

In using the tabular data, the caloric value listed for each item was considered the metabolizable energy of the food. To obtain this figure from chemical data, the grams of carbohydrate, fat, and protein were multiplied by the corresponding caloric values per gram of macronutrient (11). The sum of these is the metabolizable energy.

Gross calories were obtained for both tabular and chemical values by use of Table No. 10 of Atwater's report (10). Again the grams of protein, fat, and carbohydrate were multiplied by the appropriate gross energy values per gram and added together. In addition, gross calories of the entire diet were obtained by bomb calorimetry.

Composite diets for chemical analysis comprised the total food for the three-day menus. Both cooked and raw composites of the control and irradiated diets were analyzed.

Comments

All irradiated food offered in this study was eaten by the subjects with no apparent ill effects. It is interesting that, although irradiated food was served during fifteen successive days, the majority of the subjects believed that irradiated foods were served every few days and not consecutively for the fifteen-day period.

Visibly, the only noticeable differences between irradiated foods and the control foods were with strawberries and powdered milk. Irradiated strawberries were pale pink, and irradiated powdered milk had a yellow cast as compared with the white control milk.

The most noticeable flavor change, from the subjects' comments, appeared to be in ground beef. With ground beef, there was also a stronger odor. It is felt, however, that the acceptability of this flavor change in irradiated ground beef will only be a matter of continued introduction into the diet.

The acceptability of irradiated and control foods is summarized in Table 1. The results show that there was slight, if any, difference between the average acceptability of irradiated and control food. However, due to the necessities in this balance study, food could not always be prepared to optimal taste. It is possible that more flexible conditions might permit food preparation which would obliterate such differences. It must be noted that some individuals seemed to show more substantial differences in acceptance than others. Also, there appeared to be an indication that, on the average, no food item was placed in an extreme position on the hedonic scale.

Continued irradiated food balance studies with the

inclusion of additional foods are being carried on in the Metabolic Research Division of the Medical Nutrition Laboratory. Results will be published comparing irradiated food and control food with respect to metabolizable energy, net available energy, toxicity, and acceptability.

Summary

Dietary procedures for carrying out balance studies with human subjects on diets with irradiated food have been presented. Details on procurement, the methods for radiation sterilization, the radiation sources, the preparation of foods and dietaries, and final calculations of diets have been discussed.

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The Art of Delegation

The critical point in the career of many an executive is reached at the stage when he must either learn to delegate or cease to grow. Delegation is difficult for many people. Even when overburdened, people generally prefer to do things themselves. An executive may have difficulty in delegating properly because he does not fully understand the process involved.

Delegation means to entrust to the care or management of another, and involves three aspects: responsibility, authority, and accountability. The first two can be delegated. Accountability cannot. There are certain responsibilities a manager cannot delegate, such as the interpretation of company policy to people in his own unit and coordination with other units.

As a rule, most executives find it desirable first to delegate the details and routine, retaining authority for matters concerning the over-all operations of their function and its relations to other components and the organization as a whole.

The National Industrial Conference Board has developed some general statements on delegation. First, the responsibility and authority should be clearly defined, preferably in writing. Second, authority should be delegated commensurate with the responsibility to be discharged. This depends on having adequate facts. Third, a person should be accountable only to the person who delegates authority and responsibility to him. Fourth, the degree of delegation should be proportional to the availability of effective controls.

Delegation is relatively simple where the executive can determine through personal supervision how well things are going, but he may reach a point where this is impossible. It is then that he needs to set up an effective system of controls which permits maximum delegation and yet frees him from routine supervision. The individual who received the delegation has an obligation, too, to keep in touch with his boss and keep him fully informed. Delegation is a two-way street.

The boss must also be able to judge the capacity of his people to carry responsibility. The act of delegation and that of carrying out a delegated responsibility are both skills.

To motivate top performance from those under him, an executive must share credit, which requires humility on his part.

—Abstracted from "The Art of Delegation" by L. A. Allen. Personnel Journal 34: 86 (July–August), 1955.

Management Development—Fad or Fundamental?[1]

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WHAT is meant by the term "executive development"? After having waded through at least a significant portion of the ever-increasing flood of literature on this subject, I confess to some bewilderment. Apparently, the term means many things to many people. There seems to be little agreement on *who* is an executive or *how* he or she can be developed. In the absence of a commonly accepted definition, I have selected one by Fordyce W. Luikart, Director of Administration for the U. S. Department of Health, Education, and Welfare and former Director of Executive Development for the U. S. Civil Service Commission (1): "Management development is a term used to describe the activity of advancing leadership knowledge and ability in people who occupy (or who may be expected to occupy) positions where they have to get work done through the efforts of other people." By using "management development" rather than "executive development," Luikart emphasizes the need for developing better leaders at all levels of management—from the first-line supervisor to the top man or woman in the organization.

Traditionally, discussions of the selection and development of leaders begin with a listing of the traits or personality characteristics of a stereotype of the good leader. Yet one has only to look at successful supervisors and executives in any organization to see that they possess widely differing qualities or traits. In speaking to a group of Public Health Service executives several years ago, Dr. Douglas McGregor, an eminent industrial psychologist and former President of Antioch College, had this to say about the search for the ideal leader (2): "I suspect . . . there is no such thing as a good leader *per se*, but that a wide range of personal characteristics is required for leadership in differing situations. Even in the same situation people with startlingly dissimilar characteristics can be successful as leaders."

Based on a study of top-management coordination financed by the Alfred P. Sloan Foundation, Professor Robert L. Katz of Dartmouth has suggested (3) that a more useful approach to the selection and development of executives may be found in analyzing what they *do* (the kinds of skills or competencies which they exhibit in performing their jobs effectively) rather than what they *are* (innate traits and characteristics).

Professor Katz further suggests that, to do his job effectively, the administrator must possess competency in three areas: *technical*, *human*, and *conceptual*.

Let us take the dietitian-administrator and, to the extent my limited knowledge of the profession permits, illustrate briefly what these areas of competency are. By technical competence in your specialty, for example, we mean the knowledge relating to diet therapy, ability in menu planning, cost control of rations, facility in the use of food preparation equipment, and so on. At least 75 per cent of the undergraduate semester hour credits recommended for preparation for the dietetic profession by The American Dietetic Association are intended to develop technical competency.

Competency in Human Relations

Competency in the human relations area, of course, relates to the dietitian-administrator's ability to work effectively with those below, above, and at the same level of the hierarchy. I wish to stress relationships with those in higher levels of management because, unfortunately, most "human relations" training courses focus on only one set of relationships—that between the supervisor and her staff. My own experience in training and counseling supervisors indicates that often the most difficult and troublesome human relationships are those with the people to whom they report.

Competence in the human relations areas is apparent in a hospital dietary department when the employees at all levels are willingly collaborating toward the end of providing the best food service possible with the resources at hand. "Willing collaboration" is not synonymous with sweetness and light. If you ever find an organization in which

[1] Presented at the 38th Annual Meeting of The American Dietetic Association in St. Louis, on October 18, 1955.

everyone loves everyone else and there are no arguments or disagreements, in all probability it will be close to rigor mortis. Honest disagreement and varied points of view, when expressed in a constructive way, are essential to maintaining a healthy organization.

The dietitian-administrator with human relations competency knows that people (herself included) work more effectively in an atmosphere of approval and security where they feel free to express themselves and to participate in planning and carrying out the goals of their department.

Conceptual Competency

Conceptual skill has received less attention among writers in management than either technical or human relations competency. By conceptual skill, I mean the ability to see the enterprise as a whole—to see the role of the dietary department in its proper perspective *vis a vis* the other departments or divisions of the hospital, and to see the interrelationships among the various sub-divisions within the dietary department. It includes establishing work goals, making plans for reaching them, recognizing the interdependence of the various functions and organizational units, and how changes in any one part affect all the others. A higher degree of conceptual skill involves visualizing the hospital, college, or other institution in which you happen to be working in its proper relationship to the community, to the profession, to significant trends in medical research, educational philosophy, or other developments of major consequence to the long-term effectiveness of your organization.

The effective dietitian-administrator possesses, then, competencies in three areas: the ability to apply technical knowledge, the ability to motivate individuals and groups, and the breadth of perspective necessary to set meaningful objectives and coordinate and integrate her activities within her own department and with the larger organization. At different levels of responsibility and under varying circumstances, the relative importance of these elements varies. But they are all needed in some degree at every level of management.

Prerequisites for Successful Executive Development

Let us turn now to the question, how do we go about developing executives with these competencies? Rather than describe a particular program or set of techniques for development which might have little or no validity for your organization, I propose to discuss four basic prerequisites for successful executive development in any organization.

Favorable Climate

By far the most important prerequisite is a *proper setting* or *management climate*. To paraphrase Dr. Burleigh Gardner: What good is an executive development program in a concentration camp? In an organization where management evidences a lack of faith and trust in its own employees by such practices as withholding information until changes are accomplished or where management believes that employees can be coerced by fear or bribed by paternalistic practices into compliance with management's objectives, any executive development program will be a sham. On the other hand, such a program has a favorable environment in an organization where management displays its respect and confidence in the integrity, intelligence, and loyalty of its people.

Many of the articles on executive development deal with techniques and procedures, with little or no reference to the type of organization involved. The reader is left with the impression that his problems will be solved by the use of a particular rating procedure, replacement chart, executive inventory, training method, or other favorite device of the author. A leading authority in this field, James C. Worthy, a Sears, Roebuck official and former Assistant Secretary of Commerce, has this to say about the relative importance of techniques vs. the nature of the organization (4): "While training devices and materials have been useful, the real development of individuals has been largely a *spontaneous* process because of the characteristics of the Sears organization." Sears has pioneered in reducing levels of supervision, decentralizing authority to act, and providing supervisors at all levels with opportunities to exercise their own judgment and initiative.

Definition of Objectives

There is an unfortunate tendency among some management specialists to develop techniques before acquiring a clear understanding of the purposes they are intended to serve. This is perhaps understandable since the objectives are (or should be) defined by top management, whereas techniques are the province of the specialist. This brings us to the second prerequisite for a successful executive development program—*adequate definition of the objectives* of such a program in light of the needs of a particular organization.

To what extent are executive development programs being adopted in certain organizations simply because such programs are currently identified as one of the hallmarks of "progressive" management? And, to what extent are these programs actually keyed to what executives do (or should be doing)? Unfortunately, there is a great deal of faddism in management practices. Most of you have probably been exposed at one time or another to work simplification, work measurement, performance standards and ratings, the "J" courses in supervisory training, and so on. Each of these techniques has had its epoch of popularity among management advisers. I have had the unrewarding experience of being witness to

efforts to impose certain of these techniques—these fragments of a management improvement program—on organizations by fiat without first looking very carefully at the need for them.

Whether or not executive development programs may be considered a fad hinges largely on how well the rationale for such programs has been thought through. In a recent national survey of management development activities conducted by the American Management Association (5), it was concluded that at least 25 per cent of the more than 500 companies interviewed had "weak, inadequate, or severely limited" statements of objectives; 11 per cent of the companies with a recognized plan for management development stated no specific objectives.

While space does not permit me to develop adequately my concept of the proper objectives of a management development program, I would like to list the following ingredients: (a) All levels of management should be included, and the program should start at the top. (b) The program should focus on assisting a supervisor to perform his present responsibilities more effectively as well as preparing him for more responsible positions where such opportunities are available. (c) Major emphasis should be given to developing the human relations and conceptual skills. (d) Top management should be actively involved in carrying out the program.

Open Mindedness

My third prerequisite for successful executive development programs is that we maintain *an open mind about developmental techniques and methods.* One symptom of faddism in this area is the "one best way" to develop executives which is prevalent in some of the management literature today. Depending on the author, the panacea may be group appraisals à la XYZ Corporation, replacement charts in four colors, role playing every Thursday, or rotating jobs each full moon. We can learn from the experience of other business and government organizations, but let us not imitate blindly. Almost every organization is unique in its needs.

I am also impressed by the fact that the very process of "searching about" for the technique or techniques which best fit a particular organization has merit in and of itself. When people identify themselves with methods they have developed—a product of their intelligence and experience—the solutions always seem to fit a little better.

There being no one best way to develop executives, we should feel at liberty to use as many techniques as the imagination and resources of our organization will permit, maintaining an experimental attitude and willingness to modify what we are doing in light of experience. The real heart of management development, of course, is what occurs on the job. The example set by one's superior is probably the most potent influence on a supervisor's behavior.

While we are discussing developmental techniques, I feel impelled to inject a note of caution. Don't expect formal training to bring about miraculous changes in managerial behavior. I am convinced that training and developmental techniques, no matter how skilled, cannot compensate for faulty selection for supervisory positions, or for faulty administrative arrangements.

Systematic Evaluation Needed

Last among prerequisites for a successful program is the *need for systematic evaluation.* Executive development programs must be sufficiently flexible to adapt to the changing needs of the organization and the individuals involved. We can only keep this flexibility by maintaining a continuous check on how well the program is meeting the needs.

These, then, are my four prerequisites for successful executive development programs: (a) a proper setting or management climate; (b) adequate definition of objectives; (c) an open mind about developmental techniques and methods, and (d) provision for systematic evaluation. To the extent that adequate provision has been made for these four elements, an executive development program is more likely to be a fundamental factor in maintaining the health and vigor of the organization. To the extent that these elements are overlooked or provided for inadequately, such programs are likely to go the way of all fads.

I would like to close with this thought. Executive development is a term in current vogue to describe the selection and growth of leaders. Twenty-five centuries ago, Laotzu, a Chinese philosopher and contemporary of Confucius, had this to say about leadership (6):

> A leader is best
> When people barely know that he exists
> Not so good when people obey and acclaim him,
> Worst when they despise him.
> 'Fail to honor people
> They fail to honor you.'
> But of a good leader, who talks little,
> When his work is done, his aim fulfilled
> They will all say, 'We did this ourselves.'

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Current Comment

Kitchen Plans for the Future[1]

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A name has been given to each age in history to characterize its civilization. References to the Stone Age quickly calls to mind records of those people and life in that time. The Victorian era refers to ornate parlors and to the generally pretentious manner of living which were characteristic. Today, the Atomic Age is a phrase used to describe this period. Its significance relates not alone to the atom bomb, but also encompasses our great scientific developments, physical and monetary strength, streamlining, automation, and jet propulsion.

Industry looms large as a part of this picture. The speed and efficiency with which automobiles roll off of the production lines are awe inspiring. The slogan, "Better things for better living through chemistry" is a familiar one. The petroleum industry has developed many products and has a vast network of pipe lines spreading throughout our country. These are giants in today's industrial world.

There is another giant larger than these in terms of dollar volume, which has made much less progress. I refer to the food industry. Its methods are more Victorian than atomic. Some of its equipment, I am sure, has been held over from the Stone Age. The food industry struggles along, beset by problems of labor shortage, high labor costs, and lack of uniformity in products and services.

These are problems which other industries have solved through continual and extensive study. Research workers, employed by the industry, are paid well and are given time to discover the facts. Inventors or designers for plant equipment have the accurate data concerning production needs and methods on which to base their efforts. The equipment which they are able to produce has helped manufacturing firms to increase output and reduce payrolls to a fantastic degree. In Columbus, Ohio, for example, an appliance manufacturer turns out two completed refrigerators per minute. The original sheet of metal is received and checked by men, but from that point it is controlled by machines, through each operation to the point of crating and carting away. Where is the baker that can roll out two pie crusts per minute? Refrigerators are far more complex.

[1] Presented at the 38th Annual Meeting of The American Dietetic Association in St. Louis, on October 19, 1955.

Spending Money to Save Money

It is true that the machines, tools, and conveyors have a price; they cost a large amount of money. The production is characterized by uniformity and huge volume. We could quickly say that this is not for us. The initial cost sign is an ogre to frighten the weak hearted. Too often calculations are not carried far enough. You can be sure that this corporation considered the advantages of its investment. Without question, the machines, tools, and conveyors cost far less than the cost of equal accomplishment through human effort. We, in the food industry, should not feel that such calculations are for other industries only. We need to be more skillful in our calculations and carry our calculations far enough.

One of the most expensive pieces of equipment in our residence halls kitchen is a dishwasher which cost about $10,000. This, to us, seemed like a large sum. Calculations, however, showed that this type of continuous belt machine would eliminate two workers from the payroll. It would mean a saving of from $3,500 to $4,000 per year. The useful life of the machine can be expected to be ten or twelve years. Thus, in two and a half to three years it will pay for itself through labor saving.

Many improvements have been made in dishwashers. There is room, however, for still more. I should like to see manufacturers combine the conveyor, disposal unit, and dishwasher in such a way that it would receive soiled dishes, scrape them, get rid of the garbage, wash the dishes, and dry them without human effort. Scraping, sorting, and stacking of dishes, filling baskets, disposing of garbage, and the drying of trays and silver require labor which could and should be eliminated.

The dribbling amounts paid monthly to workers frequently goes unchallenged. Administrators will approve such expenditures but shy away from correcting a bad layout, because they are startled by the initial investment. The sum $50,000, for example, sounds like an impressive figure, and the dietitian may be reluctant to ask for it. But, an efficient layout that will eliminate three or four workers from the payroll may save much more than this. The wages for three workers at today's rates will total over $5,000 per year, or $50,000 during the average lifetime for equipment.

Need for Research

Just as other industries rely on analysis and research, the food industry must recognize their value

and use them also as a means to solve food production and service problems. Research which has been done to date is grossly inadequate. More studies are needed pertaining to time and motion economy, work simplification, mechanization, and automation. This kind of research done on a professional level would be useful to many of us who are planning new units or remodeling old ones.

Who should do such research? It is true that the dietitian is closest to the problems. She knows what needs to be done, she organizes the work, and she is professionally trained. But, she is too busy. She does not have the time to do a thorough, concentrated study that would be significant. The most that she can hope to do is to collect data in the course of her work. These, though incomplete, could be useful if pooled with data from similar sources and made available to the profession.

Qualified research workers are needed in kitchens to collect information that will serve as a dependable basis on which manufacturing geniuses can work. Getting accurate data and making interpretations should be their only obligation. They should have time enough to make a detailed study of characteristic functions and needs in each area of the food department.

Salaries paid for such research might be far less than the value in terms of savings and improved efficiency. Progress has been delayed because administrators have been hard to convince of this, and dietitians rarely have had "the nerve" to ask for it. Food managers have tended to rely on some other agency for the research. Although much is expected of colleges and universities, few schools grant enough money for institution management to provide for adequate research personnel. The "piece meal" work done by the few advanced-degree candidates does not reach very far.

Professional Group Opportunities

It is at this point that we should recognize another characteristic of the Atomic Age—that of group strength. We do not use our professional organization enough. We tend to depend too much on our "lone wolf" efforts. I believe that The American Dietetic Association could do much to pool information and support research—perhaps with substantial aid from manufacturers who realize the importance of this market.

If our professional organization were a source of valuable data to be used by architects and engineers in kitchen planning, the dietitian would be placed in a new light. Too often she is the last person to be consulted about the plans for her department. Administrators will trust the advice of architects and equipment representatives even in areas concerning work needs and organization where the dietitian's information is more complete. This often is due to her hesitancy and lack of familiarity with kitchen designing. She needs to be supplied with information that will help her to be an effective member of the team appointed to design and build the food department. This is the only way by which we can hope to prevent the building of ugly, inefficient kitchens resulting in high labor costs. Such information would also be a boon to professors of institutional equipment classes.

Money is wasted when more space is allowed for a department than is needed. On the other hand, cost may be increased if adequate space for later expansion has not been provided. Buildings cost a given amount per square foot to build. How should the space allowance for the food department be determined to provide adequately for needs without unnecessary cost? Storage area causes much debate. How much space is needed for efficient operation? How much for refrigeration? In terms of space, equipment, and personnel costs, is it better economy to have a large vegetable storage and preparation room or reduce this area and buy preprocessed vegetables? Naturally, local supplies, prices, labor rates, and product quality would have an influence on the decision.

Authentic information compiled in convenient form would save much time for busy planners and should help greatly in promoting better results.

Needs for Equipment

Every year as I work on new kitchen plans, I study diligently to make them better. The search of the equipment market is time consuming, but necessary if I am to discover the new pieces available. Calculations are continually made to determine the advantage of having certain custom-built or specially-adapted equipment which usually costs more than standard factory pieces.

A custom-built unit which we have found satisfactory is a "pass-thru" refrigerator for salads and desserts, behind the serving counter. The salads and desserts are arranged in individual portions and placed on a standard baking sheet which holds at least twelve portions. These sheets are placed in a truck, which will hold ten or twelve of the baking sheets. This load of 120 salads or desserts is rolled into a refrigerated compartment from the kitchen and can be removed a tray at a time for counter service. The "pass-thru" refrigerator was expensive to custom build, but it has more than proved its value in the two years that this unit has operated. Moving the food in large quantity and holding under desirable conditions at a convenient point has reduced labor and helped to maintain quality.

A fairly simple piece of equipment for which I have searched for months is an ingredient scale for the bake shop. There are many scales for grocery stores, post offices, and receiving rooms. Do you know of one that is specially suited to an institution bake shop? I can almost hear the remark "Oh, we

always use the balance type, with the separate weights." Shades of the Victorian era! The scale is durable and reasonably accurate, but it is awkward and inconvenient to use. Does a grocery clerk balance a big container on an 8-in. platform or scratch through a weight box for the right weight?

Institutions need a scale with a tare device for the containers normally used when weighing ingredients. Such pans are likely to weigh 4 to 6 lb. The ingredient weights will vary from a fraction of an ounce as used for spices to 30 or 40 lb. which may be used for flour. Because accuracy is important, the scale should retain it to a high degree. This equipment should be streamlined and easy to clean. The platform should be large enough to accommodate the standard baking sheet or steam table pan used when scaling mixed products for baking. The weight scale should be clear and easy to read and located at a convenient height. It needs to be countersunk so that the platform will be only slightly above the top of the table. The scale must be compact to be accommodated in this space. A good place for the scale is on the end of the table next to the mixer. This location would make it possible to save time and effort in the handling of formulas, and its consistent use would help to control quality.

Most institution equipment is heavy, and when filled with food, it becomes a very heavy load. Lifting devices are very much in order. We have a little hand truck that is a great comfort to our women workers. It is used not alone for transporting stores but also for lifting them to working height. It is useful in lifting a sack of potatoes within easy reach for filling the peeler. What a convenience it would be if mixer manufacturers would put such a lifting device on the bowl trucks, so that the baker could pan the mixes without stooping or asking for assistance to lift a heavy bowl to a higher level!

It is gratifying to observe what happens when ingenuity is combined with an acute awareness of need. One of our graduates who serves many large banquets had difficulty in getting enough servers and at the same time maintaining a satisfactory labor cost. Service of twelve dinner plates per minute off the serving line seemed to be the best that the servers could do. By devising a huge "lazy Susan" which moves automatically at a controlled speed, the same number of servers now turn off twenty-seven plates. The plate on the revolving table passes the server who does not touch it, but places a specified food item on it. This device has more than doubled output at a time when speed is very important.

Sanitation is also a constant concern in our work. A Seattle drug store has solved part of this problem by means of an infra-red cooker. Wrapped sandwiches are stored under refrigeration until immediately before they are needed. They are then quickly toasted while in the wrapper and are served delectably hot. Refrigeration and handling the sandwiches in wrapped form serve as health guards for this commonplace food.

Automatic Controls

There are numerous places in food production where automatic controls could be used advantageously. It is gratifying that bread will now disappear in a toaster without someone moving a lever. This is a step in the right direction, but the time will come when the inventors will go farther and add controls that will insure every slice to be of equal doneness regardless of whether the bread was fresh or stale, heavy or light when dropped into the toaster. This would require a "feed back" for the machine to adjust its operation to the condition of the bread.

"Feed back" is a term used in industry to designate an automatic control which is sensitive to a condition that causes it to operate. In the case of the toast, it might be the weight of the slice or the moisture in the bread that would set off the impulse. Thermostats on ovens are examples of feed backs. When the temperature drops below the degree for which it is set, more fuel is supplied to raise it; then, when it reaches a certain level, the fuel is shut off.

Automation has resulted in many instances of speed up and convenience. The grocery shopper is helped, when her arms are loaded with supplies, by having the door swing open for her to pass through. Manufacturing concerns furnish thousands of examples where automation is used successfully. Such examples are the electronic computers used by an insurance company to service 3 million accounts receivable and by a large manufacturer to process a payroll for 12,000 employees. In Corpus Christi, Texas, limited personnel in one plant, aided by machines and controls, change 20,000 bu. grain into starch, edible oil, dextrose, and high-protein stock feed every 24 hr.

Many years ago, Stoddard in New York City invented many automatic timing and checking devices. Food managers who visited there were enthusiastic about his good ideas. In his place, the patrons are recorded in the kitchen when they enter the front door. The deep-fat frier has a pop-up device like an automatic toaster. The cake mixer makes a set number of revolutions and stops. Thermostats and oven timers control the baking. It is surprising that his inventive genius has not stimulated more work by others along this line. Maybe it is because we have not asked for such equipment loudly enough.

Time Studies Needed

Studies should help us to eliminate much of the one-handed work done in kitchens. Anyone who believes that a person can control only one hand at a time should watch a musician playing a pipe organ. She will use both hands and both feet to produce music and will not hit a sour note. Location

of materials and equipment, within easy reach and clearly in sight of the worker, is important. If the musician had to stretch, stoop, hunt, or squat to reach the key, the rhythm would be broken; perhaps the chord would be lost permanently.

Why do you suppose that that girl whose shoes are white, can "dance the stars right out of the night"? It is because she has rhythm. We want to know how to build up the rhythm in our kitchen work so that human effort will flow easily with a minimum of fatigue. Research has pointed out that motions which are ballistic, rhythmical, opposite, and symmetrical are easiest. Now we need to study how to insure these qualities through kitchen planning.

The work on a seven-day and three-meal-per-day schedule tends to fluctuate. Days off in the 40 hr. labor program mean that there may be fewer workers on certain days. How do you use the slack time? Do you have freezer space that allows you to prepare foods ahead and store it for baking as needed? This may be a real economy point in your labor planning. As we know, every job consists of three steps, namely: get ready, do, and clean up. Preparing extra quantities for the freezer will help to eliminate some of the time spent on get ready and clean up. There are many bakery items that can be made in quantities for 250 as easily as for 50. Research can tell you whether the frozen product is as satisfactory as that freshly baked. Numerous kitchens have had satisfactory success with many frozen items.

The uncertain supply of kitchen labor, combined with the ever-increasing labor rates, means that we must improve the output of those whom we employ. The day is past when the problem can be solved by longer hours or lower pay. Now we must do concentrated study to eliminate waste effort and fatigue factors, and introduce mechanical aids which will help us get the job done better, faster, and cheaper.

There are a great many food departments which make up this fourth largest industry in the U. S. Industrial and school lunchrooms, college cafeterias, hospital dietary departments, hotel dining rooms, and restaurants are spread throughout all of the towns and cities and along the major highways. There is a large potential market for institutional machines and control devices. I am confident that manufacturers will recognize this fact and be eager to cooperate in developing kitchen equipment more suitable to this Atomic Age. They will be able to help us in many ways, but more initiative needs to come from our own group. We need to evidence a desire, or perhaps I should say, a determination to have more effective equipment. We, as a group, need to take the initiative in promoting essential research, and then encourage our membership to have the knowledge, courage, imagination, and gumption necessary to get it and use it.

New Trends in School Lunch Administration[1]

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IT IS sometimes difficult to identify trends, for school lunch progress and practices vary from state to state and within states. For example, some areas may move from à la carte service to plate lunch service, while in other areas the reverse trend exists. Vision is limited by personal experience and contacts, reading, hearsay. No one person can be aware of all trends, and no doubt, I will fail to mention what to some might be important new trends.

During recent years, new concepts and practices regarding the functions and responsibilities of school lunch administrators and supervisors have emerged. Not long ago, it was commonly believed that the chief functions of federal, state, and county school lunch administrators and supervisors were to inspect departments and records, to enforce regulations, and gather statistics. For example, the federal government formerly had a sizeable school lunch inspectoral staff in each state. All of these offices were closed several years ago. There is a difference in the way we approach leadership.

Today, we think the chief function of school lunch administration and supervision is that of leadership. Responsibilities are shared. Efforts are made to provide maximum local freedom and initiative aided by state and federal supervision and services. Leadership presupposes administrators and supervisors who possess leadership qualities as well as technical know-how and experience. Authoritarian supervisors are no longer wanted. "We must truly serve those whom we appear to command; we must bear with their imperfections, correct them with gentleness and patience, and lead them in the way to heaven"—*Fenelon*.

The best school lunch programs exist where many groups and individuals have the opportunity to share in defining the purposes, establishing the policies, and evaluating and working to improve the program. Administrators are attempting to keep closer to the people. Public relations efforts are being emphasized. Active school lunch advisory committees are found at federal, state, and local levels. Even the Secretary of Agriculture has such a school lunch group.

Just a few years ago many non-school groups and agencies operated school lunch programs. Today,

[1] Presented at the 38th Annual Meeting of The American Dietetic Association in St. Louis, on October 20, 1955.

nearly all school lunch programs are school-board operated. At the same time, here and there, school boards that have assumed administrative responsibility for school lunch programs for years, are saying: "School dollars are scarce, school lunch programs are expensive. Let's turn them over to commercial food service firms and get out of the school lunch business." If school boards write nutritionally sound specifications for school lunches, if the lunches meet one-third of the child's daily food needs, commercial firms will not be interested, because for them to make the usual profit would at least double current prices of lunches. This would greatly reduce participation and would not be acceptable to communities.

Promising personnel trends include more graduate managers, more A.D.A. members in school lunch work, and more men in school lunch work at all levels. Much emphasis is also being placed on personnel training programs and on up-graded courses.

Most short courses are no longer just meetings where, in the first year, participants get a smattering of this and that and each year thereafter they are repeat performances. At least three states have established certificate requirements for administrative and supervisory personnel.

In some instances, instead of expecting the several members of the professional staff to have similar qualifications, training, and experience, functions are becoming more specialized. One staff member may devote nearly full-time to business management, another to personnel training and the development of instructional and informational materials. Education and experience in the fields of institution administration, nutrition, education, and business administration should be available among the several professional members of the supervisory staff in such a set-up—and major policies and decisions made by them. This may have implications for pre- and in-service training programs for school lunch supervisors in our colleges.

Employee Benefits

To improve employee status, performance, and morale, many school food service associations are being organized throughout the country. The establishment of personnel policies regarding contracts, sick leave, holidays, and salary schedules are much in vogue. There are more regular work schedules and less "go home as soon as you get through" practices.

More and more workers are covered by state, county, or federal social security retirement systems. In at least one state, all school lunch employees are covered by a compulsory retirement system.

Fewer volunteer and pupil helpers are being used. The supply of local-level personnel is improving. For example, this fall, there were sixty-seven applicants for three jobs in one new school in a city of about 40,000 where there is no unemployment problem. With school lunch jobs enjoying more prestige, schools can screen applicants and require their participation in in-service training.

Participation in Faculty Programs

More school lunch managers are actively participating in school staff meetings in the setting up of school lunch policies. School lunch personnel spend more time with teacher groups on the educational aspects of the school lunch program.

There are more closed lunch periods with all pupils required to remain at school, staggered lunch periods and split class period schedules (to avoid long waiting lines), and fewer long noon periods with all pupils dismissed at once.

Better Administrative and Business Practices

There are more system-wide menu planning committees, more recipe testing projects and more test kitchen work. There is greater use of fresh vegetables and school-made breads. Many schools are using minimum labor foods, such as mixes (school-made and purchased), "topped carrots," pre-fabricated meats, frozen foods, and so on.

A few schools, especially at the junior and senior high level, are trying self-service.

New schools and new school lunch departments are springing up everywhere. Supervisors are spending more and more time planning layouts, writing equipment specifications, reviewing blue prints, and working with architects and contractors. Nearly every school lunch supervisor today needs considerable training and skill in the facilities and equipment field because of the percentage of time spent in this type of work, its costliness, and its effect on the efficiency of the operation. There is a greater use of labor-saving equipment, including vending machines.

More systems are centralizing purchasing and accounting. Accounting systems are more uniform and more adequate. Records are audited regularly; accounting practices are more like those for other segments of the food service industry and for other segments of the school program. There is more concern with adequate cost analysis and control.

Purchasing practices are improving. Pooled bid and specification buying is increasing. The school lunch staff is determining buying specifications rather than the food industry.

School lunch administrators are more and more leaders, interpreters, resource people, consultants, practical researchers, evaluators, personnel trainers, and developers of informational materials and guides.

The reasons for changing trends are more and more based on sound nutritional and educational beliefs as to what is best for boys and girls, and as to what is good administrative procedure and sound business practice. More and more, the principles of scientific managment are being applied to the operation of school lunch programs. Dividends are being realized.

Book Reviews

Protein Malnutrition. Proceedings of a Conference in Jamaica (1953) sponsored jointly by Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), and Josiah Macy Jr. Foundation, New York. Edited by J. C. Waterlow. Cambridge, England: Printed by University Press, 1955. Cloth. Pp. 277. Apply.

These proceedings are the report of a conference held to clarify points of difference in the syndrome known as "protein malnutrition," and to put forward ideas for discussion and further study. The term had been more or less accepted during a joint FAO/WHO meeting in 1952 in an attempt to avoid the ambiguity of the term "kwashiorkor." Still it was recognized that protein malnutrition may be operative in cases that many would not describe as kwashiorkor, as in general undernutrition or marasmus. Obviously, there was need of clarification in terms of processes and means of identification. Considerable work had been carried out in the interval between, so that the Jamaica Conference was timely.

During four sessions the participants considered the biochemistry, pathology, clinical aspects, and treatment and prevention of protein malnutrition. A formal agenda was not followed. Interruptions and discussion were encouraged, which provides an extremely alive and interesting style in the report. The general trend of the conference was set during the first session, which dealt with biochemical aspects. Dr. J. C. Waterlow, the first speaker (and editor of the proceedings), suggested two main biochemical approaches, the one concerned with processes, the other with description. A central hypothesis was put forward that a cardinal feature is depletion or reduction of total protein. After evidence was presented and discussed, it became apparent that depletion was probably not the same for all organs and tissues, since a variety of factors could influence this. As an outcome of this approach, further lines of inquiry were suggested. At the close of the first session it appeared that the two initial approaches—that concerned with processes and that with descriptions—were complementary—and so with each session. Many new and little known aspects were reported and discussed, and as a result of each participant speaking during an initial presentation of a finding or concept, the entire problem is made clearer to the reader. The problem was not solved, of course. No one had expected this. But in the opinion of the Chairman, Dr. F. W. Clements of Australia, a starting point had been defined.

The scope of the book is wide. Indeed for many of us, it will surely provide a text for study and reference. The histopathology found in kwashiorkor and the related syndromes is illustrated in a large number of plates. Graphs and tables contribute emphasis to the findings reported. A large number of references are provided for those who wish to go deeper into the subject.—*Faye W. Grant, Ph.D., St. Francis and Loyola University Schools of Nursing, Evanston, Illinois.*

The Food Program in Children's Institutions—A Handbook. Springfield, Ill.: Illinois Department of Public Welfare, 1955. Paper. Pp. 84. Apply.

This handbook was developed by a committee of eminently qualified nutritionists and social workers experienced in group care for children.

Prepared as a guide for food programs in children's institutions in Illinois, it is addressed in a straightforward and most readable style to the staff in these institutions. The subject matter deals with such questions as: "How can we teach children to eat and enjoy most foods?" "How can we provide good meals economically?" "What kind of equipment is most practical for us?"

A sound philosophy about the meaning of food and its relationship to the child's social and emotional development is set forth in the first section and is interpreted into practice in most sections of the handbook.

The content is exceedingly practical and covers with simplicity fundamentals in meal planning, food purchasing and storage, food preparation, selection and use of equipment, sanitation, and factors affecting food costs. A form for use when writing menus shows how to follow a recommended food guide when planning breakfast, dinner, lunch, or supper meals.

Suggestions about school lunches, food between meals, sweets, and beverages are sensible and handled in a constructive manner.

A section on board and staff cooperation describes major responsibilities of the board, the superintendent, physician, cook, and all staff members and how, by working together, they can make possible wise and thoughtful care for the children. "Happy is the institution whose cook and her co-workers delight in children. Because of their interest and work, a sad and unhappy child can often view the world a little more brightly."

The appendices include sample weekly menus for the four seasons; quantities of food for 10 persons for 30 days for eighteen age and activity groups at low cost and at moderate cost. Guides are given for setting up policy about the use of iodized salt, cod-liver oil, and contributions of home-cooked foods.

We question whether the section on "Preparation of Infant Feedings," which was adopted from "Procedures and Layout for the Infant Formula Room" of the American Hospital Association, fits the situation in children's institutions. If group care for infants must be provided, guides should be given for more than preparation of formula. Information about the infants' psychologic and emotional needs in relation to how they are fed and mothered is essential. To be comparable to the sound application of principles in the care for older children, reference should be made to the needs of infants and most pre-school children for their own or foster families instead of group care.

This excellent handbook should be helpful to everyone who is interested in children's institutions. It presents valuable information for child welfare workers who carry on consultation and licensing service with child care centers, as well as nutritionists, dietitians, health workers, and all employees of children's institutions.—*Ansta Barr, Regional Nutrition Consultant, Children's Bureau, Department of Health, Education, and Welfare, Dallas,* and *Mary Lois Pyles, Regional Child Welfare Representative, Children's Bureau, Department of Health, Education, and Welfare, Dallas.*

RECENT BOOKS RECEIVED

The Pediatric Years. By Louis Spekter, M.D. Springfield, Ill.: Charles C Thomas, 1955. Cloth. Pp. 734. Price $12.50.

Water. The Yearbook of Agriculture—1955. Edited by Alfred Stefferud. Washington, D. C.: Government Printing Office, 1955. Cloth. Pp. 751. Price $2.

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Current Literature

Contributed ay Janette C. Carlsen and Ethel M. Milner, The Johns Hopkins Hospital Baltimore; Elizabeth H. Tuft, Wesley Memorial Hospital, Chicago; and the Journal staff

THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Volume 3, November–December 1955

* Principles of surgical nutrition. R. D. Williams and R. M. Zollinger.—p. 449.

Nutritional evaluation during the altered physiological state after injury. J. M. Howard—p. 456.

* Nutrition and wound healing. P. Mecray, Jr.—p. 461.

* Supplementation of protein and caloric needs in the surgical patient. H. G. Barker—p. 466.

* Some aspects of nutrition in pediatric surgical patients. C. E. Koop and R. W. P. Mellish.—p. 487.

Surgery of the diabetic patient: changing concepts. W. M. Bortz, II, and E. L. Bortz.—p. 494.

Nutritional rehabilitation of the elderly patient undergoing surgery. H. A. Zintel.—p. 501.

Principles of Surgical Nutrition. A basic knowledge of nutrition is important but unless careful attention is given to actual dietary intake and weight trend, this knowledge is of little value in preparing patients for surgery. With the problem of malnutrition in preparing a patient, as in the case of obesity, there should be a day-to-day evaluation of the responses and a therapeutic plan permitting lability in the use of several available methods of feeding. Most patients will receive adequate basic requirements through oral intake, if they are encouraged by dietary changes and supplemental feedings. When oral methods fail, tube or intravenous feedings should be instituted. Homogenized milk offers a practical, nutritious source for both gastric and jejunal feedings. Weight losses and blood volume are somewhat related, and blood volume deficits have been found to range between 50 and 100 ml. whole blood per pound of weight lost. Even though there are weight losses, if the blood volume deficits are corrected, the patients will stand operation.

Nutrition and Wound Healing. The chemistry of wound healing in man is comparatively unknown; thus it is necessary to proceed on the premise that what is good for growth is also good for repair. Wound repair is a chemical action dependent on numerous local factors, such as the amount and character of foreign bodies, the vascularity of the tissues to be repaired, and the accuracy of the co-aptation of the wound edges. Experimentation has shown that wound healing is lengthened by hypoproteinemia. The fat-soluble vitamins have not been given any assigned role in wound healing. Ointments of vitamin A and D once used for surface wounds are rarely used today. The B-complex vitamins have been found to be the coenzymes in the transfer of most of the biochemically important simple organic radicals. Ascorbic acid has been experimented upon in both man and animals and found necessary for the maturation of collagen and adequate capillary invasion of healing wounds.

Protein Supplements and Caloric Needs in Surgery. Nutritional supplementation in the pre-operative period is fairly well agreed upon. Factors to be considered are the urgency of the operation, type of operation, and degree of nutritional deficiency. If the patient is able to take food by mouth and elective surgery is planned, a few days of forced feeding, perhaps including one of the protein hydrolysates if anorexia is present, will frequently reduce morbidity and mortality. Likewise, every effort should be made to provide a fully adequate caloric and protein intake to the postoperative patient who is sustaining large losses or who is unable to take a normal diet by mouth by the seventh or eighth day after operation. Until it becomes easy and safe to give 1600 or more calories per day by vein, there is nothing to be gained by giving the well-nourished patient protein intravenously in the first few days after operation. At present, it is difficult to give sufficient calories along with the protein to prevent its utilization primarily for energy rather than building of tissues.

Nutrition in Pediatric Surgical Patients. Pre-operative preparation is sometimes necessary from the standpoint of fluid balance but not nutritionally. Patients being fed parenterally usually present quite different problems on medical and surgical services. On the former, the indication is usually inordinate fluid and electrolyte loss in a sick infant, while the surgical patient is generally in good nutrition before his surgery and presents primarily a problem in maintenance of normal requirements. In the first 36 to 48 hr. of life, no fluids are given parenterally except to replace abnormal losses. On the first postoperative day, fluids are limited to 30 ml. per pound, and none are given for about 4 to 6 hr. postoperatively. On the second and third days fluid intake is increased to 45 ml. per pound and to 60 ml. per pound on the fourth. By the fifth day, oral intake is usually adequate but should not fall below 60 ml. per pound. It must be remembered that the blood volume of a 6½-lb. infant is approximately 300 ml. The loss of 30 ml. blood in such a baby is equivalent volumetrically to a hemorrhage of about 600 ml. in an adult.

AMERICAN JOURNAL OF PHYSIOLOGY

Vol. 183, October, 1955

* Relation of dietary fat to the absorption and elimination of exogenous and endogenous cholesterol. T-M. Lin, E. Karvinen, and A. C. Ivy.—p. 86.

Sterol Absorption. A study with rats was conducted to learn more about the absorption of sterols from different sources. Dihydrocholesterol and soya sterols (93 per cent sitosterol) when fed similarly were absorbed to the extent of 22 per cent. When 96 mg. cholesterol were fed, 61 per cent was absorbed. However, when cholesterol was combined with dihydrocholesterol, 36 per cent of the cholesterol and 18 per cent of dihydrocholesterol were absorbed. Thus the combination reduced absorption of both types of sterols. With a similar mixture of soya sterols and cholesterol, values approximating those obtained with dihydrocholesterol were observed. These results indicate that dihydrocholesterol and soya sterols decrease absorption of cholesterol by competing for the total capacity of the sterol absorptive mechanism (which is limited in the rat) on the basis of their relative absorbabilities.

AMERICAN JOURNAL OF PUBLIC HEALTH

Volume 45, November 1955

* Height and weight of first-grade children as a potential index of nutritional status. J. M. Hundley, O. Mickelsen, N. Mantel, R. N. Weaver, and R. C. Taber.—p. 1454.

Height and Weight as Potential Index of Nutritional Status. The main purpose of this study was to determine whether the periodic measurements of height and weight in six- to seven-year-old, first grade children might give an index of nutritional status to detect favorable or unfavorable trends of less than "mass starvation" scope. Results show that children from economically favored areas were taller and heavier than those from underprivileged areas. Both groups showed a secular increase in growth. During the depression, children from the lower economic areas showed no interruption in their trend, children from the economically favored areas showed a significant deviation from their secular trends. Although the data are not conclusive, they do indicate that further tests should be made of the reliability of height-weight measurements of school children as a continuing index of nutritional status.

ANNALES MEDICINAE EXPERIMENTALIS ET BIOLOGIAE FENNIAE

Vol. 33, Fasc. 3, 1955

* Effect of food intake on the cardiovascular response to cigarette smoking. R. Ruosteenoja.—p. 320.

Food Intake and Cardiovascular

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Response to Smoking. After 15 hr. of abstinence from food and tobacco, ten subjects—five smokers and five nonsmokers—were allowed to smoke a cigarette immediately after a pea soup meal; a control group smoked a cigarette without having had any food. The pulse rate, blood pressure, and skin temperature in fingers were measured. The increase in pulse was 7.3 ± 3.0 per minute greater after smoking in the fasting state than after the meal, the difference being almost statistically significant. The maximum pulse rate was observed at the end of smoking. The systolic and diastolic blood pressures also rose a little more in the control experiments than in those with food intake. Here, again, the top values were measured in the end phase of smoking. The skin temperatures in fingers diminished less in smoking experiments after the meal than in the fasting state. The difference is highly significant, although the vasodilative effect of food itself is taken into consideration. After the meal, the lowest temperatures were observed about 10 min. after the beginning of smoking, while in controls a slight decrease continued up to the end of observation time. The conclusion can be drawn that certain cardiovascular responses to cigarette smoking, especially the reduction in skin temperature, are weakened immediately after food intake.

ANNALS OF INTERNAL MEDICINE

Vol. 43, November 1955

Highly potent adrenal cortical steroids: structure and biologic activity. G. W. Thorn, A. E. Renold, W. I. Morse, A. Goldfien, and W. J. Reddy.—p. 979.

* The use of cortisone and hydrocortisone in allergy. W. S. Burrage, A. C. Ritchie, H. C. Mansmann, Jr., J. W. Irwin, and A. B. Russfield.—p. 1001.

* Complications following subtotal gastrectomy for peptic ulcer. D. A. J. Morey and K. Plummer.—p. 1067.

Fibrinogen deficiency. Editorial.—p. 1139.

Complications after Subtotal Gastrectomy. A significant number of postoperative complications may occur following subtotal gastrectomy for peptic ulcer. In a series of seventy-four cases, complications occurred in thirty-six patients. Hemorrhages, stomach ulcers, and gastrointestinal neuroses developed more frequently in patients who had duodenal ulcers; the dumping syndrome and anemia were more frequent in those who had had gastric ulcers.

Cortisone and Hydrocortisone in Allergy. Cortisone and hydrocortisone are useful therapeutic agents. Because these steroids possess potentially dangerous side effects, each patient should be studied with care before being placed on corticosteroid therapy. Such treatment is often far easier to initiate than to terminate. If long-term maintenance therapy is necessary, the doctor and patient must cooperate throughout treatment.

CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 73, November 15, 1955

* Steatorrhea following operations on the gastrointestinal tract. D. G. Cameron, E. H. Bensley, A. English, and P. Wood.—p. 819.

Steatorrhea after Gastrointestinal Surgery. Seven patients suffering from steatorrhea following surgery have been studied. Ages ranged from twenty-seven to sixty years. Three had megaloblastic anemia and weight loss, two iron-deficiency anemia and weight loss, one megaloblastic anemia and osteomalacia, and one iron deficiency alone. Symptoms had been present for one to six years. Only three gave a prior history of diarrhea with pale, bulky, frothy, offensive stools. In all patients, symptoms of steatorrhea appeared after surgery, the elapsed time ranging from one to fourteen years. Balance studies were conducted to study fat and nitrogen utilization. Diet for the balance studies, and three days preceding, provided 75 gm. fat, 70 gm. of which came from milk, butter, and eggs; 60 gm. protein; and 360 gm. carbohydrate, as calculated from food tables. Daily fecal fat ranged from 8 to 53 gm., representing 11 to 71 per cent of intake. In six patients, the daily fecal nitrogen ranged from 0.8 to 1.6 gm. In the seventh, daily fecal nitrogen was increased. Substantial improvement was achieved in all cases by measures commonly used in treating idiopathic steatorrhea. Diarrhea was controlled by moderate restriction of dietary fat and large doses of calcium lactate by mouth. Megaloblastic anemia was corrected by parenteral concentrated liver extract in one patient, parenteral vitamin B_{12} in two patients, and a combination of oral folic acid and parenteral vitamin B_{12} in one patient. Iron-deficiency anemia responded well to iron by mouth. Calcium lactate and vitamin D proved effective in the patient with osteomalacia. All patients gained some weight, but pre-operative levels were never attained. Cases of steatorrhea after surgery on the gastrointestinal tract are being reported with increasing frequency. Elucidation of the mechanisms concerned in its production might shed light on the pathogenesis of steatorrhea and the sprue syndrome in general.

CEREAL CHEMISTRY

Vol. 32, November 1955

* Studies on the incorporation of nonfat milk solids in whole wheat bread. II. Mixograms. B. M. Kennedy, L. R. Fletcher, and A. R. Sabiston.—p. 452.

Incorporating Nonfat Mild Solids in Whole Wheat Bread. Mixograms made on unfermented whole wheat flour dough showed that the addition of heat-treated, spray-dried nonfat milk solids to the other ingredients increased dough development time, decreased height and width of curves, and decreased somewhat the dough weakening angle. The addition of milk solids decreased the area under the mixogram curves on fermented doughs. All of the factors varied in degree of change, due to the type of flour used. Nonfat milk solids increased dough development time in both the mixograph and in the baking tests. No property of the mixograms appeared to correlate with loaf volumes of breads.

FOOD RESEARCH

Vol. 20, September-October, 1955

* Antioxidant properties of spices in oil-in-water emulsions. J. R. Chipault, G. R. Mizuno, and W. O. Lundberg.—p. 443.

* Influence of maturity and storage treatments upon the ascorbic acid content of the seeds of Southern peas. M. W. Hoover.—p. 469.

* A method of choosing judges for a sensory experiment. C. Y. Kramer.—p. 492.

Development of a scale for measuring soldiers' food preferences. L. V. Jones, D. R. Peryam, and L. L. Thurstone.—p. 512.

Anti-Oxidant Properties of Spices. The anti-oxidant properties of thirty-two spices have been studied in a simple oil-in-water emulsion system. All spices protected the emulsion against oxygen absorption. In most cases, the spices were more effective in the emulsions than in plain lard or baked pie crusts, but the order of effectiveness was different for the different substrates. Cloves were extremely effective in preventing oxidation of the emulsions. Other spices with anti-oxidant indexes greater than 5.0 were allspice, cardamon, cassia, cinnamon, ginger, mace, nutmeg, oregano, black pepper, white pepper, rosemary, sage, savory, thyme, and turmeric.

Effect of Maturity and Storage on Ascorbic Acid of Southern Peas. Samples of the Southern pea, *Vigna sinensis* L., were harvested at six different stages of maturity. The storage treatments consisted of three varieties of Southern peas held in storage for periods of 0, 24, 48, and 72 hr. at temperatures of 40°, 70°, and 100°F. Results showed that Southern peas are relatively high in ascorbic acid if they are harvested at an early stage of development and utilized immediately or stored at approximately 40°F. If they are allowed to develop to the point where the green color begins to disappear from the pod, little benefit can be derived from them as a source of this vitamin. When the pods were held at 40°F. for 72 hr., there was relatively little decrease in the ascorbic acid content of the seeds. However, as the storage temperature was increased to 70° and 100°F., there was a decrease of 42 and 54 per cent, respectively. An increase in the time of storage had the same general effect as increasing storage temperature.

Choosing Judges for a Sensory Experiment. A method for choosing judges so that the individual judges and the panel as a whole can detect differences at any given probability level is described. The method is based on statistical tables worked out by Chapman.

FOOD TECHNOLOGY

Volume 9, December 1955

* Water absorption during reconstitution of dehydrated fruits and vegetables. J. I. Simpson, I. C. L. Chang, E. C. Appel, and M. C. Bollman.—p. 608.

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* Effect of water hardness in reconstituting dehydrated fruits and vegetables. J. I. Simpson, I. C. L. Chang, E. C. Appel, and M. C. Bollman. —p. 613.
A preliminary study of the effect of gamma radiation on the baking quality of flours. L. E. Brownell, H. A. Harlin, and J. V. Nehemias.—p. 620.
* Deteriorative changes in frozen shrimp and their inhibition. M. B. Faulkner and B. M. Watts.—p. 632.
* Highlights on newly developed flavoring aromatics. A. Katz.—p. 636.

Water Absorption During Reconstitution of Dehydrated Foods. The period of soaking, temperature of the water, ratio of water to product, rate of heating and time of cooking are some of the factors which may affect the quality of dehydrated fruits and vegetables during reconstitution. Experimenting with diced potatoes, flaked onions, French-cut green beans, sweet corn, and apple slices, usually in portions serving four, it was found that increases in initial temperature of the water result in slight increases in the percentage of water absorbed. Generally, the rate of water absorption was gradual, regardless of the ratio of water to product. With green beans and flaked onions, the increase in initial temperature of water resulted in decreased water absorption. When some experiments were repeated with large portions serving up to one hundred, the general trends were similar to those for the small portions. Only slight differences in palatability were found between samples of reconstituted sweet corn, flaked onions, and apple slices when paired to compare the effect of high and low water absorption by each product.

Effect of Water Hardness in Reconstituting Dehydrated Foods. The firming effect of hard water in canning has long been a problem in canning vegetables, but has been found to be helpful in preserving the natural structure of fruits such as apples, peaches, strawberries, and tomatoes. A series of waters made hard by adding separately magnesium sulphate, magnesium chloride, calcium chloride, calcium sulphate, and calcium bicarbonate were used in an experimental reconstitution of dehydrated diced potatoes, flaked onions, green beans, sweet corn, and apple slices. The same products were reconstituted in distilled water for comparison. Calcium chloride and calcium sulphate caused in general a decrease in water absorption by all products. The effects of magnesium salts were less pronounced and less consistent, and calcium bicarbonate was least consistent of all the salts. Some concentration of most salts caused firming of diced potatoes and apple slices. None of the solutions had a significant effect on sweet corn. Response of other products to different salts was less consistent. The effect of calcium bicarbonate was least consistent of all salts.

Deterioration in Frozen Shrimp. Pre-cooked frozen shrimp when stored under adverse conditions show deteriorative changes in color, flavor, and odor after three months and texture changes after six to twelve months. The oxidative changes, which cause the loss of color, flavor, and odor, can be inhibited by use of ascorbic acid, butylated hydroxy anisole, or liquid smoke flavoring. "Smoked" shrimp, prepared by adding liquid smoke flavoring to cooking water, make an acceptable product. Pre-cooked shrimp show little deterioration after storage periods up to ten months when stored under optimum storage conditions.

Newly Developed Flavoring Aromatics. Newly discovered aromatics employed in the flavoring industry are not widely publicized as they are considered more or less trade secrets. Old time esters and ethers used in flavoring for the past eighty years have taken a downward trend. Some organic preparations are not sold under their true nomenclature. It is important to know the true chemical composition of the product. The aldehydes, such as C-14 and C-16, do not represent true products made from their corresponding alcohols or acids. These are misnomers for such chemicals as gamma undeca lactone, methyl phenyl glycidate of ethyl, and gamma nonyl lactone. The lactones and glycidates will react much more favorably with other components in flavoring than will aldehydes. If accepted as aldehydes, they should not be used with materials with might lead to polymerization. Certain aromatics have been found to be simulated aromatics under chemical names. Many modifications in flavor and aroma have been worked out by synthesizing materials not known to be present in natural products. Allyl phenoxy acetate and allyl cyclohexane propionate are two now available.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 3, November, 1955
* Cystine, tyrosine, and essential amino acid contents of selected foods. C. H. Edwards, L. P. Carter, and C. E. Outland.—p. 952.
* Effect of irradiation on meat fats. M. Sribney, U. J. Lewis, and B. S. Schweigert.—p. 958.

Amino Acids of Selected Foods. On the basis of fresh weight, chicken gizzard and liver, pork heart, kidney, liver, muscle, and tongue are excellent sources of the essential amino acids. Although pork brain, chitterlings, fatback, and many vegetables and grains are fair to poor sources of amino acids when viewed as individual foods, ingestion at the same meal of foods rated as fair or good may enable an individual to maintain a state of good protein nutrition.

Irradiation on Meat Fats. Chemical changes in meat fats (rendered and nonrendered beef and pork fats) that occur during irradiation with gamma rays and subsequent storage of the fats were investigated. On an over-all basis, increases in peroxides, carbonyl compounds, or free fatty acids were small in beef and pork fat irradiated at 2 or 4×10^6 when the presence of oxygen was minimized. A marked increase in peroxide values was observed when irradiated fats were stored at 5°C. in an oxygen-permeable casing as compared to nonirradiated fats stored in an oxygen-permeable casing, and irradiated and nonirradiated samples in an oxygen-impermeable casing or in sealed cans. A lower peroxide value was observed when treatment at 4×10^6 rep was used as compared to 2×10^6 rep for nonrendered fats irradiated in cans. Peroxide values for both dosage treatments decreased and the free fatty acids increased during storage of the samples in cans at 24°C.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 159, November 19, 1955
* Vitamin B_6 in medical practice. Council on Foods and Nutrition. R. W. Vilter.—p. 1210.
Vol. 159, November 26, 1955
* Cirrhosis of the liver treated with prolonged sodium restrictions. Improvement in nutrition, hepatic function, and portal hypertension. C. S. Davidson—p. 1257.
* Dental caries. Queries and Minor Notes.—p. 1335.
* Infant feeding and circumcision. Queries and Minor Notes.—p. 1335.
* Buckwheat poisoning. Queries and Minor Notes. —p. 1336.
Vol. 159, December 10, 1955
* A nutritional program for prolongation of life in coronary atherosclerosis. L. M. Morrison—p. 1425.
* Body weight and marital status. Foreign letters. —England.—p. 1474.

Vitamin B_6 in Medical Practice. It is safe to say that vitamin B_6 is a very important, essential nutrient, for human beings; however, deficiency states occur only under unusual circumstances, with manifestations in the skin, mucous membranes, and the central and peripheral nervous systems. Symptoms of deficiency encompass all the features of mixed B-complex deficiency disease. Most of the therapeutic claims for vitamin B_6 are still beclouded by uncertainties. Though much more investigation will be necessary before the role of vitamin B_6 as a therapeutic tool will be firmly established, clinicians should be alert to the symptomatology of vitamin B_6 deficiency so that they may recognize deficiency states that may be conditioned by new drugs, new food processing methods, and other changes in our daily life that cannot now be predicted.

Cirrhosis with Prolonged Sodium Restriction. In a study with thirty patients with cirrhosis of the liver, it was found that provision of an adequate but sodium-restricted diet prevents the further accumulation of ascites which usually accompanies the disease. The sodium was restricted to approximately 200 mg. per day. Prompt diuresis occurred in four patients, but was delayed for fourteen and failed to occur in twelve. Clinical evidence of improved nutrition and liver function and reduction of portal hypertension were found to result after prolonged therapy. A fall of serum bilirubin concentration and sulfobromophthalein retention and rise in serum albumin concentration were noted in most cases.

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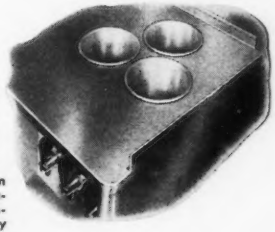

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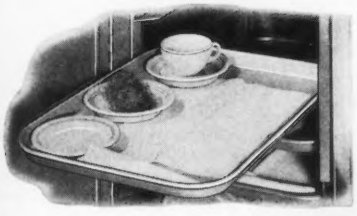

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sharp limitation of all carbohydrates has been done by the removal of monosaccharides and disaccharides. While it is impossible to remove all carbohydrates from the diet, it is advised that the diet for the caries-susceptible child be free of jams, jellies, sweetened pastries, canned peas or corn. By prolonged apposition to the tooth, glutinous foods result in greater caries activity than those of thinner consistency. For the caries-susceptible person, it is advisable to brush teeth or rinse the mouth thoroughly after each meal. Dietary control has given best clinical results in caries control for the caries-susceptible individual.

Infant Feeding. Infants, under the age of three months who are on milk formulas of proper composition do not need solid foods unless they act hungry and demand them. Cereals, because they are easily digested and high in calories, are usually the first solid food, along with strained fruits like applesauce, pears, and bananas, mixed with the cereal or substituted for it. Strained vegetables and meats are usually introduced at three months for iron and other minerals, while egg yolks, gelatin, custards, and puddings may be started at four or five months.

Buckwheat Poisoning. Although the agent causing buckwheat poisoning or fagopyrism, a disease found in farm animals which results in mild damage to the skin, intestinal and pulmonary hemorrhage, enteritis, bony necrosis, and emaciation, is not known precisely, it is very unlikely that man when eating a helping of buckwheat cakes is likely to develop the disease. It is probably true that man is susceptible to the action of buckwheat in the provocation of light, but the quantity consumed in a serving of buckwheat cakes appears to be insufficient in producing "buckwheat rash."

Nutrition for Longer Life in Coronary Atherosclerosis. An eight-year study was made on 100 patients with proved coronary thrombosis and myocardial infarction. The patients were divided into two groups of fifty each. The control group maintained their prethrombosis diets and weights; the treated group were studied and compared as to survival rate resulting from a nutritional program of a low-fat, low-cholesterol diet that was moderately high in protein, supplemented by certain vitamins, and accompanied by a significant loss in weight. After eight years, of the fifty patients in the control group, twelve had survived, a survival rate of 24 per cent. Of those treated through the above nutritional program, 28 patients survived, a survival rate of 56 per cent. The survival rate of post-coronary patients, i.e., with proved coronary atherosclerosis, on a specific nutritional program was more than 100 per cent greater than that of those in a control group who adhered to the typical American diet.

Body Weight and Marital Status. A study conducted in England on ten-year medical records of men and women is reported. Although there was no "middle-aged spread" as popularly supposed, the weight of the women increased throughout the reproductive period. The mean weight of the women increased about 3 lb. every five years. The weight of the men, who were factory workers and not a true cross section of the population, showed little increase in weight with age. In each five-year age group, married women weighed more than single women, and at corresponding ages married women with children were a little heavier than married women without children. It was concluded that the effect of childbearing was not the sole or even the most important reason for the difference in weight between single and married women.

JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 217, November, 1955

Characterization of a glycoprotein in the urine of patients with proteinuria. E. A. Popenoe.—p. 61.

* The amino acid requirements of man. XIV. The sparing effect of tyrosine on the phenylalanine requirement. W. C. Rose and R. L. Wixom.—p. 95.

* Effect of 3-acetylpyridine on pyridine nucleotide formation from tryptophan and niacin. S. Hayman, S. S. Shahinian, J. N. Williams, Jr., and C. A. Elvehjem.—p. 225.

Study of the role of essential fatty acids in liver metabolism. P. G. Tulpule and J. N. Williams, Jr.—p. 229.

Amino Acid Requirements of Man. The minimal L-phenylalanine requirements of two normal young men have been determined, first with diets devoid of L-tyrosine and then with otherwise identical rations containing quantities of the latter amino acid. The results demonstrate that tyrosine is capable of exerting a sparing effect of 70 to 75 per cent on the phenylalanine needs. Attention is called to the possible significance of these observations in human nutrition.

Pyridine Nucleotide Metabolism. Tryptophan, niacin, 3-acetylpyridine, and tryptophan or niacin plus 3-acetylpyridine were administered by stomach tube to pyridine nucleotide-depleted rats. After different time intervals, liver pyridine nucleotides (PN) were determined. Rather than inhibiting the formation of PN from niacin or tryptophan, 3-acetylpyridine gave rise to a substance, either in the presence or absence of tryptophan or niacin, which responded as PN in the assay method. Both tryptophan and niacin protected the rats against death from the acetylpyridine. The antimetabolite alone, however, caused a high mortality among the animals, although the "apparent" liver PN increased in a manner equivalent to that of the PN produced from niacin or tryptophan. The implications of these findings are discussed.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 34, November, 1955

* The relation of nitrogen retention to nitrogen intake in adults with post-traumatic malnutrition. B. T. Forsyth, M. E. Shipman, and I. C. Plough.—p. 1653.

Nitrogen Retention in Malnutrition. Thirteen soldiers who had been severely injured or wounded in combat were fed liquid diets, with levels of protein varying from 100 gm., to 180 gm., to 270 gm. daily, with calories approximating 3300. A constant ratio of carbohydrate to fat was maintained as the protein intake was varied. The diets were made from nonfat dry milk powder, cream, eggs, and sugar. With daily nitrogen intakes ranging from 0.16 to 0.85 gm. per kilogram, diminished efficiency in the use of dietary nitrogen was evident at higher levels of nitrogen intake. Non-protein calories appeared to have relatively small effect on nitrogen retention, and the rate of nitrogen storage did not appear to be related to the degree of malnutrition. It seems that nitrogen retention is directly related to nitrogen intake in malnourished adults on adequate caloric intakes.

THE JOURNAL OF NUTRITION

Vol. 57, October 10, 1955

* Red blood cell niacin and plasma riboflavin levels in a group of normal children. M. N. Bartlett.—p. 157.

* Nutritional intake of children. III. Thiamine, riboflavin and niacin. V. A. Beal.—p. 183.

* The effects of pyridoxine deficiency on some physiological factors of importance in resistance to infection. K. Wertman, W. M. O'Leary, and L. W. Smith.—p. 203.

* Dental caries in the albino rat in relation to the chemical composition of the teeth and of the diet. I. Effect of prenatal and postnatal feeding of high protein, high fat and high carbohydrate diets. J. Haldi, W. Wynn, M. L. Law, and K. D. Bentley.—p. 215.

The percentage of protein in corn and its nutritional properties. A. G. Hogan, G. T. Gillespie, O. Koeturk, B. L. O'Dell, and L. M. Flynn.—p. 225.

Niacin and Riboflavin Blood Levels in Normal Children. In a five-year study, the normal levels of red blood cell niacin in a group of eighty-six children were determined and correlated with niacin intake and hematologic studies. In another five-year study with ninety-two children, normal levels of plasma riboflavin were determined and correlated with intake. In both studies, no positive correlations were found. It would seem that neither niacin nor riboflavin, as determined in these studies, would be expected to change markedly or consistently in relation to growth.

B-Vitamin Intake of Children. This is a study of the nutritional intake during the first five years of life by a group of healthy children living at home. Thiamine intake rose steadily during the first fifteen months, reached a plateau which was maintained until just after three years, and then increased again. Riboflavin intake rose the first year, decreased the second and third years with decreases in milk consumption, and then rose between three and five years. The niacin intake tended to increase throughout this age, although children with high intakes during the second year were likely to show a decrease during the third year.

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Pyridoxine Deficiency and Resistance to Infection. Male white rats were maintained on a well-defined diet deficient in vitamin B_6 and were studied along with inanition- and *ad libitum*-control rats. There was no change in the total erythrocyte count in the peripheral blood of any of the animals. Microcytosis as well as leucopenia were found in the deficient rats. Their differential cell counts showed a percentage increase in polymorphonuclear leucocytes and a decrease in lymphocytes. In them, the complement activity was the lowest. Cellular migration was reduced. Relative granulocytosis and lymphopenia were observed in the exudates and bone marrow of the inanition control rats but was more marked in the vitamin deficient rats. There was no alteration in capillary permeability.

Dental Caries and Chemical Composition of the Teeth and Diet. The possibility that any of the major foodstuffs, when consumed in predominance in the postnatal or prenatal diets, affect the mineral composition of molar teeth, making them more or less resistant to caries was studied on the teeth of albino rats over a period of 150 days. High-sucrose, high-protein, and high-fat diets were given, and it was found that the preponderance of any of these foods had neither prenatal nor postnatal influence on the mineral composition of the teeth. The greater cariogenicity of the high-sucrose diet as compared with the high-fat and high-protein diets which had been demonstrated before cannot therefore be ascribed to any changes induced in the mineral composition of the teeth by preponderance of sucrose in the diet.

JOURNAL OF PEDIATRICS

Vol. 47, October, 1955

* Oxygen therapy in the newborn premature infant. I. Its relation to some aspects of protein metabolism. E. P. Crump, J. F. Scheck, B. K. Mukherji, R. Harris, and W. D. Turner.—p. 442.

Vol. 47, December, 1955

* Fat retention in infants fed breast milk and humanized cow's milk. P. Guilbert, D. Baker, and L. A. Barness.—p. 683.
* Vitamin A deficiency in infancy. M. H. Bass and J. Caplan.—p. 690.

Oxygen Therapy in Premature Infants. The effects of fasting and thirsting upon a total of eighty-three newborn premature infants with and without supplementary incubator oxygen were studied in respect to protein metabolism. Exposure to extra incubator oxygen was associated with a somewhat greater percentage of weight loss following birth than when infants breathed ordinary incubator air. No significant difference was noted in total plasma protein concentration. When infants were exposed to supplementary oxygen, the NPN content promptly increased. This increase was 12 to 15 per cent above that of controls.

Fat Retention. Five healthy, newborn male infants were fed diets consisting of "humanized" cow's milk alternated with pooled human breast milk for periods of nine to twenty-seven days, with an average duration of about fifteen days on each type of feeding. Determinations of fat balance, stool pH, and bacterial flora, including *L. bifidus var. pennsylvanicus*, are reported. Contrary to the results of previous studies, there was no significant difference in percentage of fat retention on the two types of feedings; the fecal pH and relative numbers of gram-positive rods in the feces were similar for both groups. *L. bifidus var. pennsylvanicus* was present in the stools during the periods in which the infants received breast milk and in some periods on "humanized" cow's milk immediately following breast milk feeding. This organism was diminished when feeding of the modified cow's milk formula preceded breast milk feeding.

Vitamin A Deficiency in Infancy. Vitamin A deficiency is unusual in infancy. The average infant fed on milk obtains enough of this vitamin, even without the addition of a vitamin supplement. However, with infants who are allergic to milk and are receiving a milk substitute lacking in animal fats without added vitamin A, the case is different. Two cases of vitamin A deficiency are described. An allergic infant kept for five months on a diet which contained no milk, no animal fats, and no vitamin A supplement developed malnutrition, severe anemia, hydrocephalus, hematuria, and xerophthalmia. All of these symptoms promptly responded to large doses of vitamin A, and the child made a complete recovery. The second infant, deeply icteric due to proved congenital absence of the bile ducts, with a low vitamin A blood level, developed acute hydrocephalus which disappeared with intramuscular administration of vitamin A. The possibility of this symptom being due to the low vitamin A level is suggested.

THE LICENTIATE (India)

Vol. 4, April, 1954

* Problems of nutrition in India. V. N. Patwardhan.—p. 1

Nutrition Problems in India. The food production in India cannot adequately meet the needs of the population. There is an acute cereal shortage, and during the past few years the government has made efforts to increase production. The milk supply is short with the prices high. Most animals live on by-products of human foods and do not receive proper pasture, causing low production and lack of good meat. An integrated policy for animal and human nutrition is needed to solve the food problem along with prevention of the adulteration of foodstuffs. Leafy vegetables are available and cheap but because they are cheap many look down on them and do not use them, missing supplies of vitamin A and ascorbic acid. Vitamin A is grossly deficient along with the B group and ascorbic acid. Nutrition research has made it possible to fight malnutrition, but general apathy and lack of understanding have led to government-run canteens, education and propaganda on nutrition, and the formation of projects for more and better food.

THE MILBANK MEMORIAL FUND QUARTERLY

Vol. 33, October, 1955

* Maternal and newborn nutrition studies at Philadelphia Lying-In Hospital. Newborn studies. III. Size and growth of babies during the first three months of life. R. V. Kasius, A. Randall, IV, W. T. Tompkins, and D. G. Wiehl.—p. 341.

Size and Growth of Babies in First Three Months. Data on the measurements of weight, length, and chest circumference during the first three months of life are presented for 1335 white and Negro infants. The maximum average monthly weight gain during the first three months occurred during the second month; however, if weight increase during the first month were measured from the minimum after the postnatal weight loss, the average daily gain during this interval was about equal to that of the second month. The percentage increase in weight was also at a maximum in the interval from the day of minimum weight to one month. The largest average gain in length and chest circumference in both absolute and relative measure occurred during the first month. During the three-month period, the Negro babies increased more rapidly in weight and chest circumference than the white babies of the same sex, and the boys gained more rapidly than the girls. There were only slight differences by race and sex in growth in length. The highest correlations between the birth measurements and each of the subsequent monthly measurements were found between the measurements at birth and one month and the lowest between those at birth and three months. Correlations between the increments of growth for each measurement during each month were considerably lower. Material illustrating the relationship between birth weight and subsequent weight, and between the mother's pregravid weight status and the infant's weight is presented.

MILITARY MEDICINE

Vol. 117, November, 1955

* Appetite and acclimatization to high altitude. E. LeB. Gray.—p. 427.

Appetite and High] Altitude. Weight loss during acclimatization to high altitude is a universal observation. The phenomenon first appears at about 9,000 ft. and increases with the altitude. This weight loss appears to be due to a reduction in appetite. Although the appetite of the military personnel in mountain training was keen, satiety was quickly reached. While some soldiers were unable to become acclimatized and had to be sent elsewhere, this number was relatively small. The majority of men appeared to adapt readily to their new environment and to enjoy their surroundings. The messes were good, there being no complaints. There was no noticeable evidence of mountain sickness. When the troops were subjected to high altitudes for a period

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sufficiently long to become acclimatized, food consumption increased enough to maintain weight. The ability to adapt to high altitudes varies greatly with the altitude and the individual. At the altitude range of 9,000 to 13,000 ft., some individuals have little or no ability to make this adjustment. While there was no evidence of anorexia, satiety is apparently arrived at too soon. That the caloric deficiency was largely carbohydrate is shown by the low percentage of carbohydrate eaten and by the fact that the rations waived or returned to the Quartermaster were principally carbohydrate. In the diet of the unacclimatized soldier, the percentage of carbohydrate was low, while the fat was relatively high.

NEW ENGLAND JOURNAL OF MEDICINE

Vol. 253, November 17, 1955

Metabolism and clinical significance of the carbohydrate components of connective tissue. E. Calkins, M. Soodak, and W. Bauer.—p. 865.

Vol. 253, November 24, 1955

* Gaseous inflation of the gastrointestinal tract. M. M. Lieberthal and H. D. Frank.—p. 901.

Inflation of the Gastrointestinal Tract. Experimental and clinical evidence indicates that the ingestion of air, by swallowing or by aspiration, is the most important method by which gas reaches the gastrointestinal tract. The literature reveals only six reported cases of filling of the gastrointestinal tract with gas in the absence of significant organic disease. Two cases are presented as further evidence that ingestion of air is the main source of gaseous inflation of the gastrointestinal tract.

PHYSIOLOGICAL REVIEWS

Vol. 35, July, 1955

Biological evaluation of proteins. J. B. Allison.—p. 664.

Vol. 35, October, 1955

* Human energy expenditure. R. Passmore and J. V. G. A. Durnin.—p. 801.

Human Energy Expenditure. In this review an attempt is made to collect some of the available knowledge concerning the rates of energy expenditure in various human activities as determined by physiologic methods. Much more information is available from the dietary studies of the energy intake of different population groups, and dietary studies provide indirect information on over-all rates of energy expenditure. Both sources are necessary in drawing up physiologic scales of calorie needs. Such scales are of great importance, since they must be the basis for food rationing when food is scarce. Knowledge of the energy expenditure of an individual will usually indicate food needs. But the energy needs can also be indicated from the dietary intakes, and a comprehensive and critical review of the literature on dietary intakes would also be most useful. Studies of energy expenditure and of food intake are complementary, and much information is already available. A more precise understanding of these data will increase our practical knowledge of man's food requirements and capacity for physical work.

PROCEEDINGS OF THE NUTRITION SOCIETY

Vol. 14, No. 2, 1955

*Distribution of alcohol consumption and of calories derived from alcohol in various selected populations. E. M. Jellinek.—p. 93.

*Vitamin deficiencies in alcoholism. H. M. Sinclair.—p. 107.

Assessment of the energy value of human foods. E. M. Widdowson.—p. 142.

*Some difficulties in estimating the energy value of human diets. D. F. Hollingsworth.—p. 154.

Pre-eclamptic toxaemia, weight gain during pregnancy, and the energy value of the diet in late pregnancy. A. M. Thomson and W. Z. Billewicz.—p. v.

Consumption of milk and vitamin concentrate by pregnant women in Aberdeen. J. W. Marr, E. B. Hope, J. D. Stevenson, and A. M. Thomson.—p. vi.

Palm wine in human nutrition. C. R. C. Heard.—p. xi.

Some nutrients of the plantain (*Musa paradisiaca*) and its relation to protein malnutrition. F. E. Byron.—p. xii.

Food intakes and faecal excretions of two men while sledging in North Greenland. J. P. Masterton, H. E. Lewis, and E. M. Widdowson.—p. xvi.

*Some effects of thiamine deprivation and caloric deficiency in the rat on learning and on behavior under stress. F. Knopfelmacher, M. Khairy, R. W. Russell, and J. Yudkin.—p. xvii.

Alcohol Consumption. As far as the national calorie budget of most nations is concerned, with few exceptions, the contribution from alcohol is not significant. However, in nutritional surveys of ethnic or occupational groups, or social classes, it cannot be ignored. It may be contributing significantly towards the total calories and, more important, it may be the chief source of interference with nutritional functions. The author recommends that surveyors should not neglect the possible contributions and interference from alcohol.

Vitamin Deficiencies in Alcoholism. Reduction in calories, but not usually thiamine deficiency, appears to increase the amount of alcohol ingested by the rat. Although it is possible that dipsomania can arise in man from a metabolic disorder in alcohol metabolism which can be overcome by massive doses of one or more nutrients, no dramatic success of such therapy has yet been achieved. Alcohol mobilizes vitamin A from liver stores but does not improve the final rod threshold of the dark-adapted eye. Alcohol appears to have a direct effect in decreasing food consumption. Chronic alcoholism enhances this direct effect in various ways and can lead to nutritional deficiency. Laennec's cirrhosis in chronic alcoholism is caused by dietary deficiency of lipotropic substances. The mechanism whereby alcohol increases the requirement of methyl-group donors is unknown. Alcoholic psychoses have not been proved to be caused by nutritional deficiency, but acute deficiency of thiamine can cause Wernicke's encephalopathy. Alcoholic polyneuropathy appears to be closely related to the function of thiamine but is not necessarily caused by its dietary deficiency. Decreased phosphorylation or blocking of the catalytic action of lipoic acid might play a part.

Difficulties in Estimating the Energy Value of Diets. There are several difficulties in estimating energy value of human diets, and they might be classified as follows: (a) the problem of fitting the condition of the food to that to which the available average chemical analyses apply; (b) the problem of fitting the description of the food to that in the table of food composition; (c) difficulties relating to the method of expressing carbohydrate; and (d) difficulties relating to the choice of factors for conversion of protein, fat, carbohydrate, and other energy-yielding food constituents to calories. The errors which can be made under any of these headings are discussed.

Thiamine Deprivation and Caloric Deficiency and Learning and Behavior under Stress. It was found that thiamine deficiency, up to the time of onset of polyneuritis, produced no differences in behavior under stress or in learning. On the other hand, caloric control animals (pair-fed with thiamine-deficient group but receiving adequate thiamine) showed greater mobility under stress, learned a discrimination problem faster, and were less rigid in behavior. These effects of hunger on behavior are of interest in relation to present concepts of irrelevant drives in learning.

PUBLIC HEALTH REPORTS

Volume 70, November 1955

* Emergency handling of frozen foods. J. B. Hozier and J. A. Anderegg.—p. 1045.

* Effect of topical fluorides on teeth matured on fluoride-bearing water. D. J. Galagan and J. R. Vermillion.—p. 1114.

Emergency Handling of Frozen Foods. As far as is known, the danger to frozen foods as a result of atomic attack can be dismissed with the comment that such food in unbroken packages should be safe. They are heavily protected in well insulated and closed home and commercial refrigerators and freezers. In a period without electricity, consideration must be given to the preservation or consumption of large quantities so that spoilage will be low. Operators of warehouses should be encouraged to have auxiliary power sources. Prompt distribution of dry ice to owners of home freezers will lower losses. Foods in warehouses might be saved by transfer to mobile units. Plans to distribute rapidly all foods should be made to meet the total loss of power, and then large stocks will not be wasted.

Effect of Topical Fluorides on Teeth Matured on Fluoride-Bearing Water. The effect of topical fluoride therapy on teeth matured on fluoride-bearing water has not been thoroughly explored. In a study in Tucson, Arizona, with 350 children ages seven to sixteen, half the children's teeth were treated four times with a 2 per cent sodium fluoride solution after initial prophylaxis. The other half were given four

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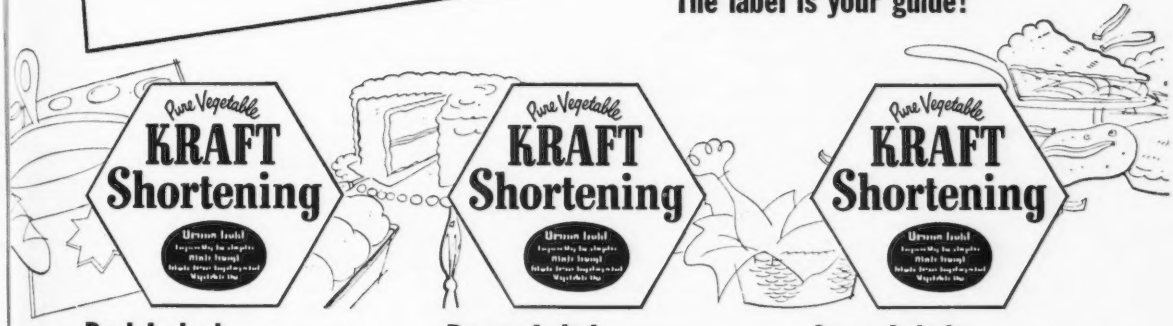

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applications of tap water at the same sitting. At the end of one year, it was observed that there were 9 per cent fewer caries in the treated teeth. However, this is within limits of chance variations and might have occurred had the children not been treated.

ADULT LEADERSHIP

Vol. 4, November, 1955
* Talking it over.—p. 3.
* Why is communication difficult? B. Sarchet.—p. 14.
* Talk is cheap. H. Raebeck.—p. 19.

Adult Education. The common core of all adult education has several elements: (a) The focus is on adults. To work effectively with adults, there needs to be an understanding of them as individuals and as group and community members. What are their needs? How do they think? What do they value? (b) The purpose is to change or influence them. (c) Educators and leaders are agents for encouraging change. What are the roles and relationships which will enable educators and leaders to be most helpful? (d) Adults are responsible participants in the learning process. Their maturity and experience permit them to make choices which demand the respect of the educator or leader working with them. (e) Tools are needed to do the job. What methods, skills, and techniques have been found useful in working with adults? (f) The educative jobs are done in the setting of the organizations and the communities in which people live and work. The goals, purposes, and methods are in part determined and limited by the habits of the community and the particular demands made on the adult. (g) Educators and leaders have goals for their work. Each person is responsible for deciding for himself whether his leadership or educative influence is really contributing to the goals which he has chosen as most worth while. These are major common interests of adult educators—interests which can unite them despite differences in content and setting, and in specific methods and techniques.

Why Is Communication Difficult? It is often important for groups which represent different segments of the community to communicate with each other. Any differences between organizations in goals, appropriate behavior, or methods can make intercommunication hard. Confusion about function and purpose which the organization itself may have is another major difficulty. Most members bring conflicting interests to the groups they join. They want the feeling of belonging which can come only from a small group, yet they want to move out to new experiences. Most groups try to preserve some feeling of "exclusiveness," while at the same time seeking to widen their circle of influence. Also, a group will try to cling to a function which it sees as being uniquely its own, but at the same time will want to reach out to other activities. In addition, the aging process takes place in organizations as it does in people. It is primarily a change in, or loss of the original identity and purposes of the organization, as new leaders are inducted and as membership changes and broadens. Lack of identity—uncertainty about purpose and function—present one of the greatest barriers to communication between organizations. The essence of cooperation is being able to give up, or at least to modify. The organization which is not sure of what it is supposed to do cannot give up anything for fear that what is given away might be its most vital function. These barriers are very real ones which we will never overcome completely. We can make a start by realizing that communication is not a solution but a tool for trying to arrive at solutions.

Talk Is Cheap. This is an amusing yet effective bit of writing on jargon and the communication problems we create. The author states that every profession has its "trade talk," and to the extent that the words used have precise definitions, clearly understood by all who speak and hear, such "jargon" can facilitate communication. But in adult education, there is little room for words that need to be defined in a professional dictionary.

AMERICAN RESTAURANT MAGAZINE

Vol. 39, November, 1955.
* It doesn't have to stand idle!—p. 70.
* "Weigh in" profits with scales.—p. 72.
* Mixers do double-duty.—p. 74.
* ABC's of good equipment maintenance.—p. 74.
* Slice a bigger piece of success.—p. 76.
* When you're cooking with steam.—p. 80.
Safe seats protect income.—p. 116.
Vol. 39, December, 1955
*Help yourself to better buffets. C. E. Blackburne. —p. 62.

Idle Equipment. To get more use from equipment, "breakfast" waffles can be served in different wrappings for lunch and dinner. Covered with glazed fruit or hot fruit salad, waffles make an appetizing noon meal, as does chicken à la king over a waffle. For Friday lunch, creamed tuna or salmon over a waffle can become a menu money-maker. A mixture of waffle batter and pecans or chocolate chips, topped with ice cream, makes a dessert treat, as does the basic waffle topped with fruit or chocolate sauce and covered with meringue. The broiler can be used for breakfast bacon, freeing the griddle area for frying eggs or making hot cakes. Mass production of toast is also possible in the broiler; 1½ loaves placed in an 18 by 26 in. baking pan will brown quickly. The deep-fat fryer can be used to toast sandwiches. Other foods easily prepared in this way are baked apples, chicken croquettes, turnovers, French fried bananas, dumplings, and deep-fat fried onions. The counter roaster is a versatile device because it converts from a roaster to a food warmer. A steamer can also be used for many tasks other than moist-cooking of meats and vegetables. A low pressure steamer will boil 18 doz. eggs in 15 to 18 min., and a high compression steamer will do the job in 4 min. A steamer can also be used to prepare spaghetti, rice, noodles, macaroni, disjointed or whole fowl, lobster and shrimp dishes, beef stew, Hungarian goulash, and Swiss steak.

"Weigh In" Profits. The basis of cost control is weight as determined by accurate receiving, ingredient, and portion scales. Cost control begins in the receiving room where purchases should be check-weighed to assure full paid-weight. Next, proper use of ingredient scales will save costly ingredients used in cooking and eliminate menu failures. The use of portion scales is another effective control measure because of the breakdown by weight of costs to a standard "per serving" basis. In addition, the use of this scale assures patron satisfaction through uniform servings. Portion scales can be used effectively in conjunction with slicers, meat saws, mixers, grinders, and choppers. The scales should be designed for accurate, quick reading and high speed operation. Portability is desirable as well as a compact, easy-to-clean design.

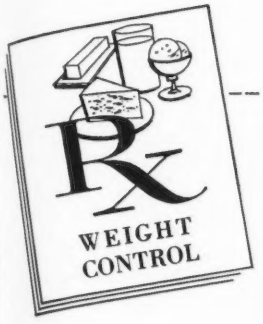
Double-Duty Mixers. An all-purpose mixer with attachments is a valuable asset in restaurant operation. A chopper attachment increases profits by converting leftovers into croquettes, meat patties, or sausage. The vegetable slicer cuts cabbage for salads and cole slaw; slices potatoes, nuts, bananas, cucumbers, celery; shreds or grates cheese, raw carrots, beets, nuts; and cuts julienne or shoe string potatoes. A coffee and spice grinder attachment insures freshly ground ingredients. A soup strainer for making cream of tomato and corn or split pea soup is available. There is a similar colander attachment for making cranberry sauce and apple sauce. An oil dropper facilitates preparation of mayonnaise. Delicious drinks can be produced with the juice extractor. Knives and cleavers are sharpened with another attachment.

Equipment Maintenance. Twenty-six rules for good maintenance are listed in this article, each using a letter of the alphabet as first initial.

Controlled Slicing. Controlled slicing and proper carving of meat are essential for maximum profit. Slicing of breast and thigh meat of turkey at a setting to produce twenty-one slices per pound is suggested. Then the meat is placed on trays and covered with waxed paper or aluminum foil, ready for service. By setting the gauge plate to shave ham, it is possible to increase the sales appeal of the ham sandwich, although the actual amount of ham used is no greater than would normally be required. Correct procedure for handling and carving turkey and boning ham are included.

Cooking with Steam. Steam cooking provides top flavor and color appeal and saves time and labor as well. For maximum efficiency, it is best to train one person in steaming, entrusting the preparation of all foods so cooked to that person. Food is prepared for steaming in much the same way as for boiling.

measuring up!



The doctor's help is often needed if a busy man is to keep his waistline from expanding along with his responsibilities.

Insurance statistics show mortality rate is high among overweight persons . . . increasing with increasing overweight. Yet weight can be lost and desired weight maintained on a palatable diet of ordinary foods . . . easily obtained at the family table or chosen from a restaurant menu.

Medically supervised studies on weight reduction show active men and women achieving satisfactory weight losses, without undue hunger or loss of pep . . . on diets containing approximately equal weights of protein, fat, and carbohydrate. A combination of protein and fat slows digestion and absorption of nutrients, thus delaying the onset of hunger between meals.

The foods included in these diets provide all essential nutrients in amounts recommended for adults. Only calories are in deficit. Dairy foods are an important feature of these meals because of their high proportion of nutrients in relation to the calories they provide. Their taste appeal and variety make the diet easy to follow until the desired weight is lost.

Dietitians! Send for the convenient leaflet and diet instruction sheets containing menus for three full meals a day for an entire week. Diets at two moderately low calorie levels are included. These diet instructions will be useful even where a person may require a different calorie level for weight loss. For such individuals, the physician can suggest desired modification, retaining the basic diet plan.

These materials are yours on request —without cost or obligation. Simply fill out the coupon below and mail it today.

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Vegetables should be crisp and turgid before cooking. Removal of tough stems will shorten cooking time. Long root vegetables should be sliced lengthwise. Seasoning may be done before or after steaming. Frozen foods should not be defrosted before steaming. Pressure-type steamers operate about 10 to 20 per cent faster than the free-venting type. Young or new vegetables cook in considerably less time than older ones. Freshly-picked vegetables cook faster than those long-stored. The size of the vegetable and type of container used also affect cooking time. Vegetables should be cooked just slightly under the "done" stage. Large or small quantities of food can be easily handled with a minimum amount of labor. In many cases, food can be cooked in cafeteria inset pans and transferred directly to serving stations without additional handling. Details on preparing and cooking individual vegetables, fruits, and meats will be found in this article.

Mass Feeding by Buffet. In business and industry, the buffet table has gained in popularity because large numbers are served easily. Instructions for preparing garnishes, hot hors d'oeuvres, canapes, and cold items, as well as decorating fish and meat are presented, along with a discussion of table arrangements and centerpieces. Twenty-seven items to plan and watch for are listed. Two menus are given—one serving 635 and the other from 2500 to 2800. Equipment rentals for a new building dedication party are listed.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 19, December, 1955

* Food service by contract. H. M. MacGregor.—p. 45.

Food Service by Contract. Muhlenberg College, Allentown, Pennsylvania, has found that a professional management organization which manages the entire food service operation best solves its food service problems. In several years' experience with this method, there has been a definite savings in the cost of operation. The college has had no risk of loss in the food service department because the total yearly cost is known before the academic year begins. The quality of the food has also improved. The elimination of detailed day-to-day food service managerial duties by the business office is another advantage. The provision of special food services for college functions is also provided. In addition to the basic operation of the food service, the management firm makes available a number of supporting services through a central staff, including: an accounting department that processes invoices and writes payrolls; an equipment consulting department that makes recommendations on equipment and layout; a personnel department that handles personnel requirements; and a purchasing department that controls purchasing procedures. The main disadvantage is the problem of control. At Muhlenberg, however, the contractor places over-all control of the service in the hands of the college authorities. An objection to the contract service also may come from local businessmen who may fear a reduction in their sales. Such is not necessarily the case, for many purchases are made locally. Another possible objection is that colleges are sometimes reluctant to part with long-term employees. At Muhlenberg, the contractor has retained the majority of food service personnel who were qualified. The food service management also uses student labor. In all, the operation has been adapted to the general atmosphere and pattern of college living.

HOSPITAL MANAGEMENT

Vol. 30, November-December, 1955

* Holiday tray favors. R. M. Reuning.—p. 39.
* Pay-as-you-eat plan. G. E. Toles.—p. 93.

Holiday Tray Favors. There is no limit to the variety of tray favors which can add a sparkle of festivity to holiday food. Illustrations and directions for making Christmas favors in the forms of Christmas trees, Santa Claus, angels, a toboggan, and a fireplace are given.

Pay-as-You-Eat Plan. Columbus State Hospital at Columbus, Ohio, has taken the first step in a program to switch employee subsistence at Ohio's mental, correctional, and juvenile institutions from the present monthly salary deduction plan to a self-sustaining cash basis. The new system will have a number of advantages. Not only will employees pay only for the meals they eat, but they will also get a greater choice of food. As the food will no longer come from a common allotment with the patients' or inmates' food, there will be no question of employees' food reducing the food allowance for patients and inmates. Under the new plan, institutional executives and other personnel will no longer be permitted to draw raw food from the commissary or run bills at the neighborhood grocery to be paid by the state in exchange for a flat monthly deduction from their salaries. The menus will have more variety, and prices will be kept low enough to cover costs of buying, preparing, and serving food.

HOSPITALS

Vol. 29, December, 1955

* We switched to centralized service. J. L. Hurley.—p. 99.

The ADA convention in review.—p. 101.

Centralized Service. At St. Francis Hospital, Grand Island, Nebraska, it was decided that centralized tray service and centralized dishwashing was one of the best answers to the problem of serving patients three times each day with a minimum of time and labor. It would provide better supervision and help eliminate the heavy turnover and absenteeism in the floor kitchens. It would speed up food distribution. It would assure more uniform portions of food. Although the new system has not reduced, to any great extent, the employees required for the dietary department, it has concentrated these employees in one area, thus eliminating part of the delay in service. Supervision is more constant, and thus it is possible to stimulate each dietary employee to have a greater pride in his job. The success of centralized food service depends almost entirely on the speed with which trays are delivered from the kitchen to the patient. At St. Francis Hospital there is a lapse of 8 to 10 min. from the time each tray truck leaves the main kitchen until the last of the twelve trays on the truck is delivered to the patient. Most patients are highly complimentary of the new system and have stated in the patient-opinion questionnaire that the food was "appetizing, hot, and attractively served." The new system saves space (six floor kitchens are now available for chart, linen, and storage rooms), saves time by streamlining food distribution, and cuts payroll costs $3000 annually.

INPLANT FOOD MANAGEMENT

Vol. 2, December, 1955.

* They serve nutrition, too, at New England Telephone & Telegraph.—p. 26.

Nutrition in Industrial Food Service. In addition to providing meals for employees, this New England company is interested in seeing that those meals are nutritionally well balanced. The menus are planned to make it easy for the customers to select balanced meals from the serving lines. Duplicate cafeteria lines on each side of the main kitchen speed service. Choices include six entrées, two vegetables, two types of potatoes, and salad plates, in addition to grilled foods and sandwiches. Complete meals at a special price are another way of encouraging employees to include the Basic 7 in each meal. Charts of the Basic 7 foods, as well as those showing the nutritive value of milk and other dairy products, are displayed in the two dining areas. A layout chart of the kitchen areas and a chicken pie recipe accompany this article.

INSTITUTIONAL FEEDING AND HOUSING

Vol. 5, November, 1955

* Make the product suit your needs. C. Blackburne.—p. 28.
* Cooking equipment maintenance tips.—p. 34.
* How to handle fresh fruit.—p. 43.
* Noise costs you money. E. S. Graybill —p. 44.

Vol. 5, December, 1955

* How to buy silverplate flatware.—p. 26
* How to buy stainless steel flatware.—p. 26.
* Brush, broom, and mop care. H. Whitman.—p. 30.
* Inventory takes teamwork. A. N. Califano.—p. 40.
* Waste control through preventive maintenance. C. Draper.—p. 48.

Buying Products to Suit Needs. If purchases are made on a comparative price basis alone, quality soon becomes less important than price. When this occurs, net yield suffers. Consequently the operator is plagued not only with

When your geriatric patient turns up his nose at certain foods . . .

the specification of greater menu variety may give that lagging appetite a real lift. Wide prescription selectivity is possible with Gerber Strained and Junior (minced) Foods. For Gerber offers 4 cereals—more than 60 fruits, vegetables, meats, soups and desserts—all processed to preserve appetizing colors, flavors and high nutritive values.

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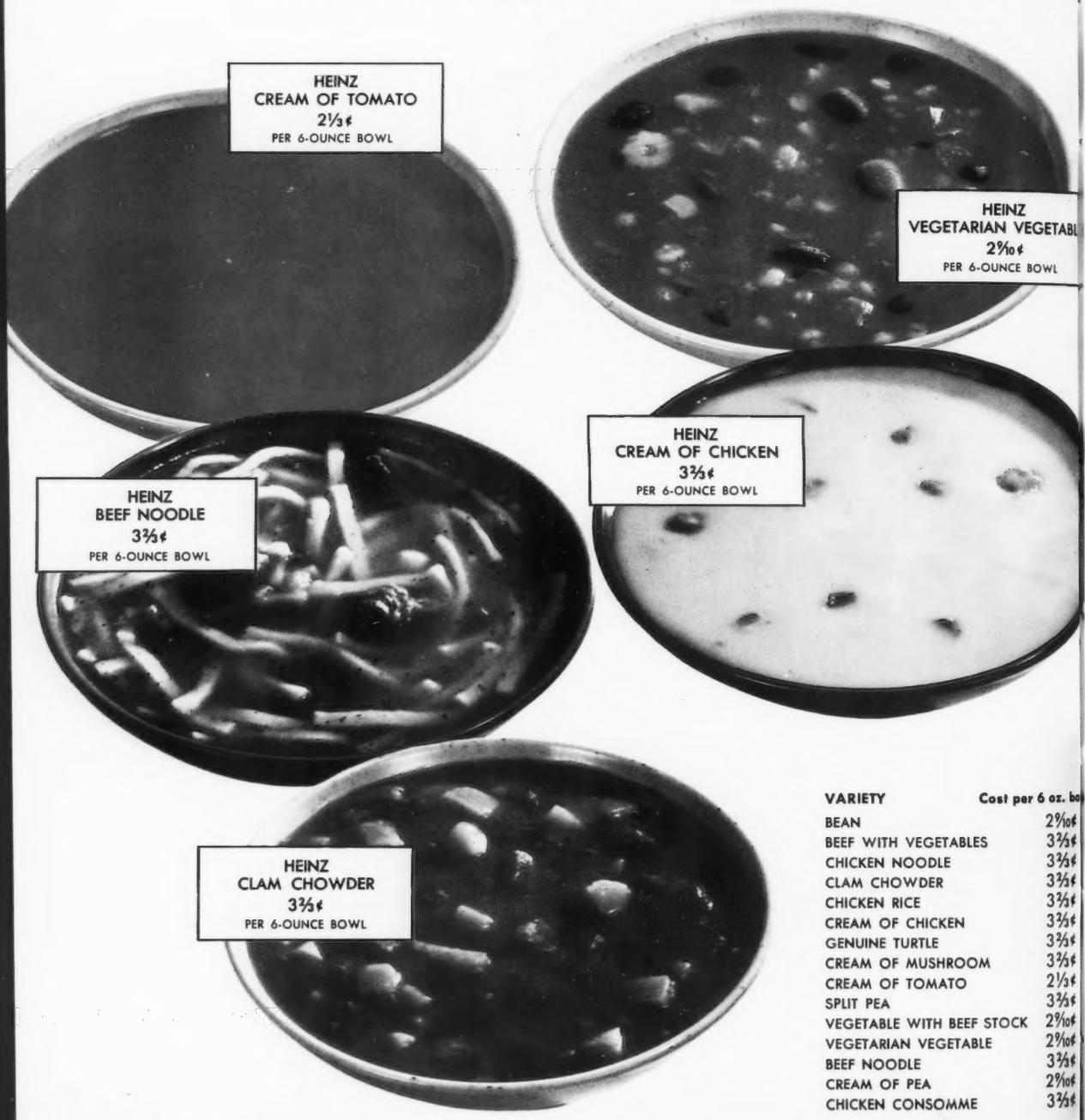

VARIETY	Cost per 6 oz. bo
BEAN	2⁹⁄₁₀¢
BEEF WITH VEGETABLES	3⅓¢
CHICKEN NOODLE	3⅓¢
CLAM CHOWDER	3⅓¢
CHICKEN RICE	3⅓¢
CREAM OF CHICKEN	3⅓¢
GENUINE TURTLE	3⅓¢
CREAM OF MUSHROOM	3⅓¢
CREAM OF TOMATO	2⅓¢
SPLIT PEA	3⅓¢
VEGETABLE WITH BEEF STOCK	2⁹⁄₁₀¢
VEGETARIAN VEGETABLE	2⁹⁄₁₀¢
BEEF NOODLE	3⅓¢
CREAM OF PEA	2⁹⁄₁₀¢
CHICKEN CONSOMME	3⅓¢

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THEN COMPARE COST. Many kitchens do not know their actual cost on soup because so many of the costs are *hidden*. It's easy to measure the cost of ingredients but how about these hidden costs:

Labor costs . . . Chef's time . . . fuel . . . spoilage and leftovers . . . tied-up cooking equipment

These costs cannot be figured exactly, but they *are* costs and should be considered.

COMPARE AND SEE FOR YOURSELF. Let your own taste and your own costs decide. Fair enough? Fill in the coupon and mail it for your free Chef-Size tin of Heinz Soup *now!*

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Heinz 51-oz. Chef-Size Soups are condensed . . .

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lower quality food but increased food cost. Adopting a product-aptitude program designed to find the product which best suits the needs helps cut food costs. The plan provides that purchasing agents notify purveyors to submit samples. A testing panel makes a "blind" test and the article found most acceptable from both a price and quality standpoint becomes the accepted brand. Managers are then notified that they should specify this brand when ordering the item. The plan is designed to prove that it is not the cost-per-can but the cost-per-portion that is important and to aid the managers in ordering the proper merchandise for the use to which it will be put. Where this approach has been developed, savings up to 10 per cent in food cost have been realized.

Care of Cooking Equipment. Careful maintenance of cooking equipment reduces costs and wasted time. An oven which does not maintain the proper temperature wastes fuel, cooking time, and causes food loss. Excess heat from an oven can increase ventilation costs, cause frequent redecoration, and even rapid labor turnover. Poor temperature control in a fry kettle is equally wasteful, breaking cooking fat down quickly, and producing a burned product or one that is soggy and unpalatable. Here is a check list of maintenance tips to use as a guide for keeping ovens, griddles, hot plates and range tops, fry kettles, waffle irons, toasters, and motors in good condition.

Handling Fresh Fruit. Instructions are given for storing apples, apricots, bananas, berries, citrus fruits, cranberries, grapes, melons, peaches, and pears. All are best refrigerated, with the exception of bananas, and melons are refrigerated only to hold over supply.

Noise Costs Money. Kitchen and dining room clatter lowers employees' efficiency and gives customers indigestion. Proper acoustical treatment of these areas can reduce the noise level by as much as 65 per cent. Sometimes all that is needed is to cover the ceiling with a suitable acoustical material. Thick carpeting and heavy draperies help further. It may be desirable to cover additional areas with acoustical material, and some operators have found it worth while to line the under side of tables with such material to cut down floor noises. A chart showing properties of acoustical materials accompanies this article.

Buying Silverplated Flatware. Hotel plate is usually of a simple design with a bright finish. When choosing flatware, weight and strength are important. A simple test shows how much pressure is necessary to bend the spoon bowl where it joins the handle. A desirable piece should have good resistance to bending. A well constructed fork will bend with difficulty when pressure is exerted on an outside tine. Shape of flatware is also important. Choose forks with fairly long and narrow tines and knives with enough handle for comfortable use. Knives are usually available in two styles: solid stainless steel blade and silverplated handle in one piece, and hollow handles with stainless steel blades. Spoons should have an egg-shaped bowl with thin edges. Good pieces will be smoothed at the edges and between the fork tines. Because spoons wear through first on the back of the bowl, good plate has an extra layer or overlay of silver plate there. Tarnishing is one of the disadvantages of silver.

Buying Stainless Steel Flatware. Patterns of stainless steel for hotel use are simple, and the finish may be bright or buffed. Color ranges from a blue metallic to a silvery hue in the more expensive ware. Graded pieces have an expensive, well-designed appearance. A smooth finish along handle edges and between fork tines indicates good workmanship. Ungraded pieces are often "pebbly" in these areas. If the piece is well made, it will take considerable strength to bend it. Handles on knives are available either in solid one piece extensions of the blade or in two-piece hollow or solder-filled types. The former is stronger, but the latter may be more comfortable to grip. Corrosion resistance is one of the main advantages of stainless steel, and it needs no polishing.

Brush, Broom, and Mop Care. Mops and brushes are made for specific cleaning equipment. When a careless or unknown maintenance worker uses the wrong tool, he is usually shortening its use and raising maintenance costs. This article contains a checklist of some of the precautions that will make maintenance easier, treating floor brushes, wet mops, dry mops, fiber brooms, and scrub brushes separately. The author includes the suggestion that there must be a specific place where such equipment can be stored. The space should have room for hanging mops and brooms and shelves for brushes, cleansers, and soaps; there should also be good ventilation, so that damp equipment will not mold or rot.

Inventory Takes Teamwork. Only monthly inventories provide management with adequate knowledge of current food supplies. To get the work done as quickly as possible, management must set up a detailed work pattern for faster inventory-taking. Such duties should be carefully scheduled and assigned. New merchandise must be cost-marked and in place. Fewer problems will result if accountants supervise the inventory periodically. The author lists eighteen specific steps to guide those in charge of inventory-taking and discusses the special problems that may arise when taking inventory in December.

Waste Control. Preventive maintenance applies to every phase of operation. Your employees will maintain your standards if they realize what they are and that it is important that they do so. To be sure that your standards are adequate and that they are maintained, they must be in writing. Many operators use one or more manuals, each directed to a specific group of personnel. These might include a policy manual, a training manual, a purchasing manual, a formula manual, a merchandising manual, a housekeeping manual, a labor control manual, an equipment maintenance manual, and an operational manual for management condensing all the information contained in the other manuals. In addition to this reference material, it is wise to have one or more schedules for everyday operation, i.e., daily and weekly work schedules; housekeeping schedule; equipment maintenance schedules; buying or ordering schedules; production schedule; inventory schedule; gross control schedule; and a special event schedule.

INSTITUTIONS

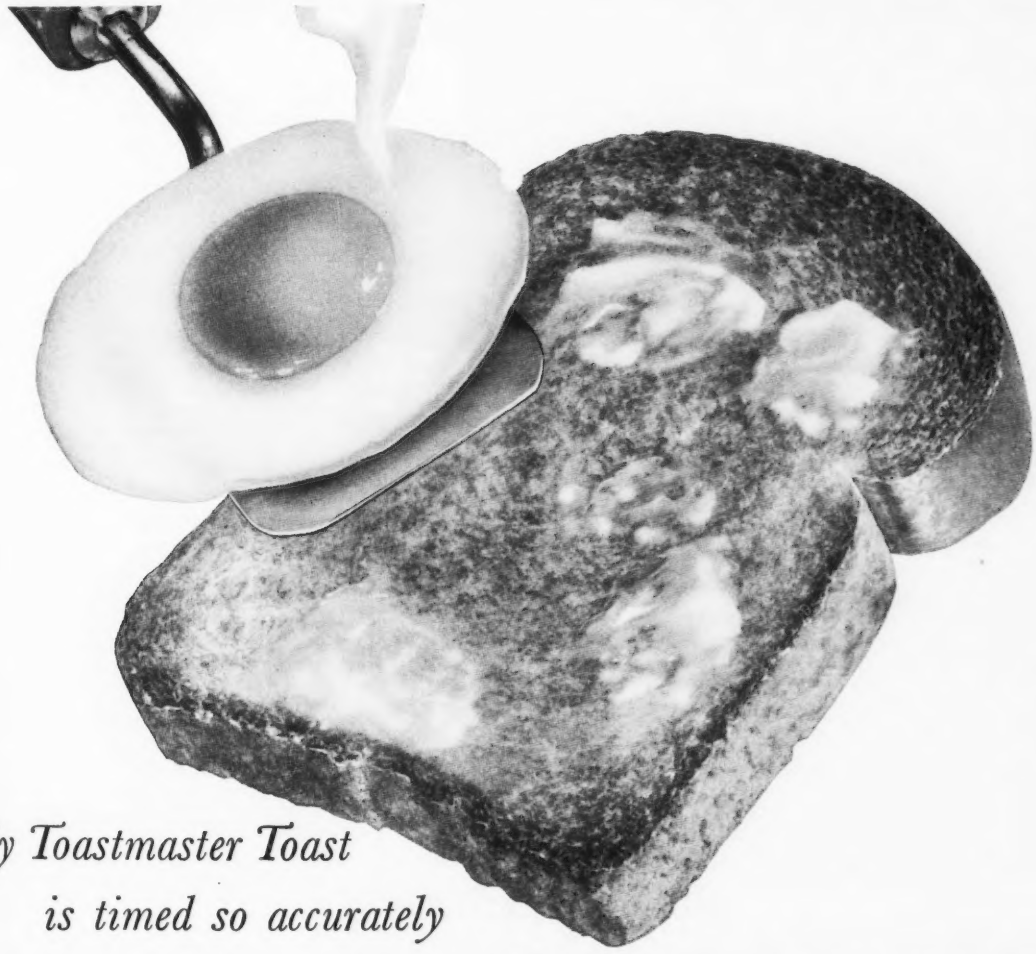
Vol. 37, December, 1955

* Sanitation—questions and answers. W. H. Haskell.—p. 30.
* Make efficient tool of table of organization. V. W. Eimicke.—p. 84.
* Plus appeal for menus.—p. 112.

Sanitation in Delivery of Supplies. There are advantages of sanitation in the purchase of high quality foods. Such produce arrives in good condition and with minimum waste. Containers are clean, thus keeping dirt to a minimum and reducing transfer of insects and rodents into the institution. Milk and milk supplies, when ordered from an approved dealer, meet official sanitation standards. Shellfish are marketed under a certificate of approval also, and each approved plant is given a number which is stamped on the container. In the case of oysters, it is considered dangerous to repack them into smaller cans from a gallon container because of the possibility of contamination. It is much safer to purchase smaller containers, unless the contents of the larger cans can all be used immediately. Milk should never be poured or dipped from cans into pitchers and served. The use of bulk milk dispensers or individual containers is more desirable. Canned goods should be carefully examined for swellings or punctures. Rusty cans should be condemned, if there is any possibility of the rust penetrating the can. Packages should be examined for breaks which expose contents. Sugar, nuts, coconut, and flour should be removed from the bags and cartons when opened and stored in clean metal containers with tight-fitting lids. No food should be placed on the floor during storage as flooding may result in contamination and/or water loss. It is a good practice to clean thoroughly all returnable crates, cases, and cans as soon as possible. Such a practice eliminates insect breeding.

Table of Organization. A table of organization is effective only if it facilitates the business of the institution, and if it is reviewed at least every six months to provide for still more efficient operation. Major steps in the development of a table of organization for a food service operation are illustrated here.

New Wheat Product. "Bulgur" wheat, long the staff of life in the Middle East, is finding use in quantity food establishments in this country. It can be used as a vegetable and served with



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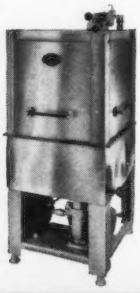

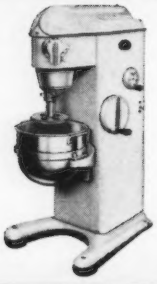

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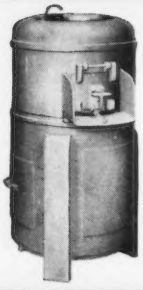

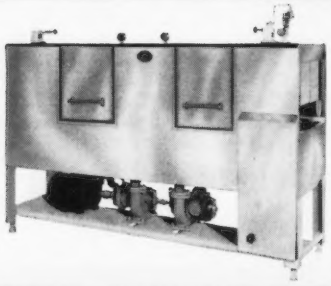

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WITHIN A YEAR

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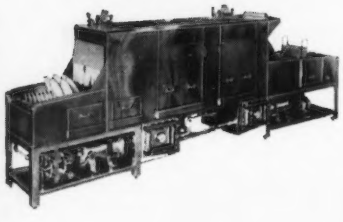

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meat, poultry, fish, or other vegetables. Added to meat loaves, meat patties, fish loaves, croquettes, and other similar dishes, it provides nutritive value as well as desirable texture. "Bulgur" wheat has a nutty flavor similar to that of wild rice and teams well with other ingredients in hot breads, puddings, and cookies. It is also useful for fish and poultry stuffing, in stuffed peppers, squash, tomato dishes, or casseroles. A 5-oz. portion costs only about 1½ cents.

THE MODERN HOSPITAL

Vol. 85, November, 1955

* Make the most of employes' opinions. O. M. Murphy and E. J. Pansky.—p. 67.
* Job classification tells who does what. W. J. Silverman.—p. 75.
* Developing administrative food controls. K. E. Flack —p. 106.

Vol. 85, December, 1955

* Food should look good enough to eat. N. Tucker. —p. 116.
* Paper food service meets with favor. A. S. Lane —p. 122.

Employees' Opinion Survey. The employees of Bartholomew County Hospital, Columbus, Indiana, were surveyed to "clear the air"—also as a means of compiling suggestions for a long-range improvement program. A check-off type of questionnaire with a five-step gradation in degree was used. When the questionnaires were tabulated, areas of definite needs were highlighted. First, a need for a training supervisor to inform employees of the privileges and non-monetary aspects of employment was demonstrated; second, a definite need for supervisory training in communications was evident; and third, a revision of the payroll policy from a monthly to a bi-monthly basis seemed wise. As a result of the survey, a nurse educator was recruited to train employees, and the supervisory training situation was studied. A new accounting system now makes paydays twice a month possible. The questionnaire is printed in its entirety.

Job Classification. Job classification is a sound basis for selecting, transferring, and promoting employees and for establishing equitable salaries. A hospital which undertakes a position classification study, complementing it with an adequate pay survey and salary plan and then building its personnel program around this framework is well on the way toward improving employee morale and more efficient operation. Such a study is outlined in detail, and sample questionnaires and job classifications are included.

Administrative Food Controls. Food ration allowance translated into attractive, palatable meals has been the goal of the New York State Department of Mental Hygiene. In developing its food control system, the author outlines seven steps of evolution: (a) the analysis of the population within the institution; (b) study of the characteristic food pattern as indicated by food issued; (c) classification of foods into significant groups; (d) revision of food uses to improve the nutritional value of the meals served; (e) establish-

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REAL CHICKEN FLAVOR . . . Le Gout Chicken Base, made only from fresh, selected Government Inspected Heavy Fowl, is roasted in our own special ovens, seasoned to perfection, and packed under supervision of a U. S. Government Inspector. This careful preparation is your assurance of a quality product . . . and the profit-winning flavor of fresh roasted chicken.

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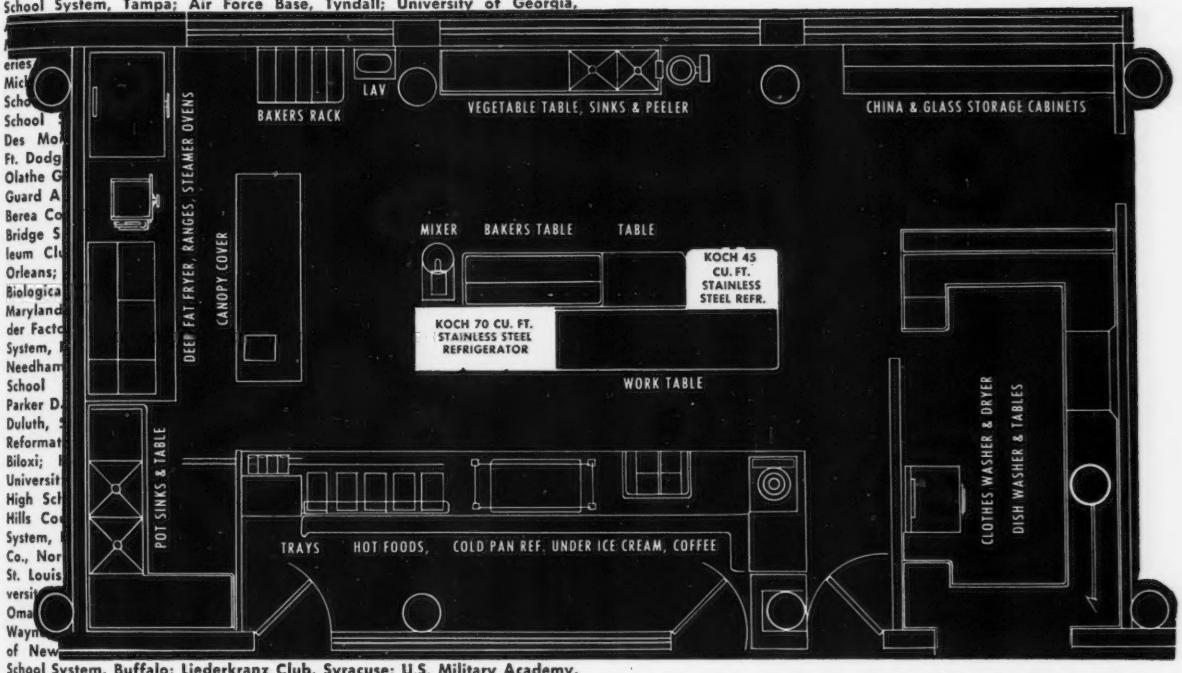
ing the food ration allowance per day; (f) developing the technique of distribution of the food ration over the period involved; and (g) nutritional accounting of the food ration and its use. In addition to a discussion of these seven points, a basic menu pattern for a six-month period is included, as well as tables showing caloric requirements of mental patients, meat rations, food ration allowances, daily amounts and approximate nutritional evaluation of the food ration allowance for hospital patients.

Appealing Food Displays. Food service is considered from an esthetic standpoint. Principles of good food merchandising for cafeterias, as outlined by the author, include the following suggestions. Salads should be placed on the display counters in straight, even rows so that their basic line is uniform. Place them on the counter with regard to eye appeal by contrasting color, shape, and texture, but follow some consistent pattern so that the customer can know what to expect. Place other foods on the counter according to a pattern: entrées—whole cuts first, with meat extenders and meat substitutes second and third; bread—white first, then rye, whole wheat, and raisin; desserts—cookies, then fruit and pie, puddings, then fruit and cake. Place other foods to best advantage, i.e., pie should point toward the customer. The icing side of cake should be toward the customer if the piece is wedge shaped; if square, it is placed erect. All individually dished foods are placed in even rows on the counter. Prevent messy edges on salad and fruit dishes. Keep ice counters clean and counters of all units wiped free of spilled food. Never leave cleaning cloths in sight of the customers. Check cleanliness of the dishes as served. Avoid spreading a serving of food all over the plate or dish. Keep the serving unit of a food whole as much as possible; if the serving breaks before or during service, arrange it on the plate as a whole piece. Try to serve standard portions. Well chosen accompaniments to menu items are of benefit in pleasing the customer and making the food service attractive. Place the accompaniment to a food beside the food on the counter. A garnish is chosen to give color, flavor, shape, and texture contrast, but keep within the principles of good design. A list of appropriate garnishes is shown in an accompanying table.

Paper Food Service. A New Jersey hospital reports favorable results with paper service after two years' experience. Paper service was first introduced in a two-month test period. Approximately 650 patients used the paper service during this period. Of that number, 98 per cent found nothing wrong with the taste of the food and 85 per cent had no trouble eating or drinking. Food stays just as hot served on paper as on china. Only four patients requested the use of china during the test period. One of the most important things learned from the test was that paper service is economical. Deducting the cost of the paper service, the change

Locust River Club, Birmingham; Washington County Hospital, Chatom; Air Force Base, Mobile; Bryce Hospital, Tuscaloosa; University of Alabama, Tuscaloosa; State Prison, Florence; Arizona State College, Tempe; Sparks Memorial Hospital, Ft. Smith; University of Arkansas, Little Rock; Arsenal, Pine Bluff; Texarkana Country Club, Texarkana; Disneyland, Anaheim; Town House Motor Hotel, Fresno; University of California, Goleta; Kaiser Permanente Hospital, Los Angeles; Ambassador Hotel, Los Angeles; Naval Shipyard, Mare Island; Women's Athletic Club, Oakland; Division of Forestry, San Luis Obispo; Children's Hospital, San Francisco; Stockton College, Stockton; Latter Day Saints Church, Stockton; University of Colorado, Boulder; Broadmoor Hotel, Colorado Springs; Air Force Base, Denver; Park Hill Golf Club, Denver; Girl Scouts, Denver; Bia-Consolidated Indian Agency, Ignacio; Soldiers-Sailors Home, Monte Vista; Victoria Convalescent Hospital, Hartford; School System, Washington; Senate Building, Washington; U.S. Treasury Building, Washington; Georgetown University, Washington; St. Regis Kraft Corp., Eastport; University of Florida, Gainesville; Farm Colony, Gainesville; Vocational School, Melbourne; School System, Miami; Pinecastle Air Force Base, Orlando; School System, Pensacola; Florida A & M University, Tallahassee; School System, Tampa; Air Force Base, Tyndall; University of Georgia,

. . . a good layout demands good equipment *anywhere*



School System, Buffalo; Liederkranz Club, Syracuse; U.S. Military Academy, West Point; University of North Carolina, Chapel Hill; Duke University, Durham; Women's Club, High Point; North Carolina State College, Raleigh; Ridgecrest Baptist Assembly, Ridgecrest; School System, Winston-Salem; Apple Creek Country Club, Bismarck; School System, Minot; Church of the Covenant, Cincinnati; School System, Cincinnati; Federal Reserve Bank, Cleveland; School System, Cleveland; School System, Columbus; Hiram College, Hiram; Elks Lodge, Lima; Service Creamery, Lorain; School System, Springfield; Army Base, Ft. Sill; School System, Muskogee; Skirvin Tower Hotel, Oklahoma City; Chamber of Commerce, Tulsa; State Dept. of Agriculture, Salem; School System, Bucks County; Army Ordnance Depot, Broughton; McGuire Hospital, New Brighton; School System, Pittsburgh; The Crown Hotel, Providence; Naval Minecraft Base, Charleston; Clemson College, Clemson; Liberty Life Insurance Co., Greenville; State Dept. of Health Laboratory, Pierre; State Hospital, Yankton; Baptist Orphanage, Chattanooga; School System, Knoxville; University of Tennessee, Knoxville; Cudahy Packing Company, Memphis; Kimberly-Clark Corporation, Memphis; School System, Memphis; Belle Meade Country Club, Nashville; David Lipscomb College, Nashville; Government Project, Oak Ridge; Vocational School for Girls, Tullahoma; Air Force Base, Amarillo; Bar-K Guest Ranch, Austin; Women's Club, Austin; Harvest Club, Beaumont; School System, Corpus Christi; Dallas Club, Dallas; School System, Dallas; School System, El Paso; International Club, El Paso; First National Bank, Fort Worth; Brae Burn Country Club, Houston; Municipal Airport, Houston; State Home for Senile, Kerrville; School System, San Antonio; Perrin Air Force Base, Sherman; Commission for the Blind, Temple; St. Edward's School, Texarkana; Veterans' Hospital, Salt Lake City; Mary Fletcher Hospital, Burlington; Army Engineer Ft. Belvoir; Naval Air Station, Norfolk; Government Installation, Ft. I King County Hospital, Seattle; University Teaching Hospital, S Ozanam Home, Tacoma; School System, Charleston; Veterans Adm. pital, Huntington; Y.M.C.A., Green Bay; Marquette University, Milwa School System, Milwaukee; Municipal Hospital, Two Rivers; School System, Cheyenne; University of Alaska, Fairbanks; Hickam Air Force Base, Honolulu; International Air Port, San Juan; Beth David Synagogue, West

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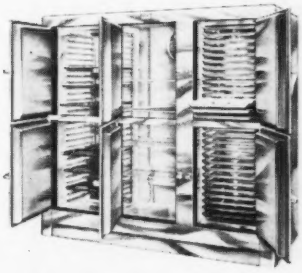

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When you have hot foods, hot soup, hot coffee to be serviced a distance from your kitchens . . . THAT'S WHERE PORTABLE AerVoiD VACUUM INSULATED HOT FOOD AND LIQUID CARRIERS COME IN.

AerVoiDs begin where cooking kettles and coffee urns, leave off. They provide a means by which the output of stationary cooking equipment can readily be transported and serviced at points distant from your kitchens . . . expediting service, saving time, money, labor.

AerVoiDs cost but a fraction of the cost of urns, steam tables, cooking kettles. Made of stainless steel, sanitary, high vacuum insulation (exclusive with AerVoiDs) that insures thermal efficiency to keep foods hot for servicing even miles from a central kitchen and with high retention of all the essential food elements and flavors as demonstrated by laboratory tests.

Not being anchored to one location, portable AerVoiDs open up immense new possibilities in expediting mass feeding. The only "complete line" of portable hot food servicing equipment on the market . . . sizes and types to feed thousands or just a few.

Experienced mass feeding consultants to help you without cost.

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has saved approximately $2000 a year. The average cost per patient for serving a meal with all-paper service is less than 3 cents. Other advantages include the greater sanitation, no breakage, lighter and easier-to-handle tray loads, fast and easy disposal (no dishes to wash), and a noiseless operation. This hospital carries only a two-month supply of paper cups, plates, and dishes which are kept in the same storeroom formerly used for glassware and china. No additional space is required.

PERSONNEL JOURNAL

Vol. 34, October, 1955

* Emotional maturity needed for success in business. L. J. Cantoni.—p. 173.
* Extemporaneous role-playing: its several advantages. A. W. Foley.—177.

Vol. 34, December, 1955

* Supervising women is different. H. M. Vollmer and J. A. Kinney.—p. 260.

Emotional Maturity in Business. A worker's emotional adjustment has much to do with his success on the job. As people (employees) continue to mature or regress emotionally as adults, it is important that skilled counseling be provided as well as understanding and wise handling by the supervisor. In gaining genuine maturity, the worker has great needs beyond security, which his work must fulfill—that is, satisfaction from his job. As an individual develops his own set of values, this will include his idea of how he can best do a good job. Whenever an employee has a personal criterion of job performance superior to the established standard, he should be given the opportunity to perform in line with his highest aspirations. However, no matter how mature he is, he never reaches a point at which he does not need favorable attention from colleagues and superiors. This, when he gets it, means he is doing a good job. It is the responsibility of the supervisor to provide his employees not only with the opportunity to be effective on the job but also with an atmosphere in which each individual receives ample recognition.

Role-Playing in Human Relations. The author describes a teaching device which may be used in training to illustrate the content of a lecture in a dynamic manner; it may also be used as a source of material and a stimulant to discussion. The player shapes his own part. He is given a capsule description of a situation and the briefest instruction. Each incident is played out in 1 or 2 min., allowing time for all to participate. Each situation requires the role-player to think and act "on his feet" just as he would in an actual situation. The procedure can be used as a tool for evaluation of employees as well as in training, but self-evaluation and group-evaluation should be emphasized to keep the spark of spontaneity. A sincere, employee-centered, progressive-minded leader-supervisor could use this "learning by doing" technique to help break down communicative barriers between himself and his group.

Supervising Women. Men and women have different attitudes toward their work. These differences account for the characteristics and behavior which they want in their supervisors. Using information obtained from questionnaires, the authors name factors which women tend to emphasize as desirable in supervision. Female employees tend to be less interested in the work itself than males. Women place more emphasis on "human relations" or diplomacy in supervision. Impartiality is particularly emphasized as desirable, and women frequently mentioned the importance of work orders given in a courteous and respectful tone of voice. The outstanding supervisor in the view of female employees is also one who is generally considerate of personal problems and attitudes which may be more characteristic of women than of men. Above all, women express appreciation for supervisors who attempt to create a pleasant social atmosphere and who stress the "human" element in supervision. These findings have special implications for supervisor selection and training. For male workers, it is important to select individuals who have outstanding abilities in the work to be supervised. While these qualities are also important in supervising women, it is even more essential to choose women's supervisors who show outstanding abilities in human relations.

PRACTICAL HOME ECONOMICS

Vol. 34, December, 1955

* How to deep fry.—p. 29.

How to Deep Fry. To achieve an attractive and digestible product by deep frying, careful cooking procedures must be followed. First, select a bland oil or fat that can be heated to high temperature without smoking or decomposing. Use an electric fryer or a heavy frying kettle. A deep-fat frying thermometer is essential when using a frying kettle. The temperature of the shortening should be between 365°F. and 400°F., according to the food being fried. A frying basket is convenient for lowering food into the shortening and removing it when it is cooked. Small amounts of food should be cooked at a time, so that all food is completely immersed in shortening. After frying, food should be drained on absorbent paper to remove excess fat.

RESTAURANT MANAGEMENT

Vol. 77, November, 1955

* At the bargaining table. G. P. Schmidt.—p. 49.

Bargaining with Labor. Knowing the employer's rights and the union's duties before you start collective bargaining sessions should help achieve the best possible contract with the union. This article covers: avoiding the "standard form" contract; preparing for the sessions; cautions on the union's contract proposal; limiting the "bargaining unit"; why the arbitration clause is important; wording the discharge clause; management rights; employer's rules and regulations; and limiting seniority.

New St. Vincent's Infirmary cooks with modern *GAS* equipment

Hospital cooking calls for the best in kitchen equipment. That's why new hospitals, like St. Vincent's infirmary, Little Rock, Arkansas, choose Gas and modern Gas equipment.

Gas gives flexibility and control for specific diet requirements. Gas is clean and dependable with no interruption in service. Gas also brings out the goodness and appetizing appearance of food to make it appeal to the patient.

Gas equipment at St. Vincent's includes Garland ranges, Fish reel-type bake ovens, Blodgett bake ovens, Steam-Chef steamers and Savory toasters. Gas also provides St. Vincent's with hot water.

For information on how you can benefit by installing modern Gas equipment, call your Gas Company commercial specialist. He'll be glad to discuss the economies and results Gas and modern Gas equipment provide. *American Gas Association.*

News Notes

St. Peter's, Rome TWA PHOTO

Rome, The Eternal City. All roads literally will lead to Rome this year, where the Second International Congress of Dietetics will be held September 10 through 14. Here is a magnificent opportunity to meet dietitians and nutritionists from many countries and to discuss mutual projects and problems. And, between meetings, you will be able to explore and absorb the beauties of Rome.

You will find that Rome is a city of contrasts. Still standing, next to the ultramodern railway terminal opened in 1950, is a fragment of the wall built to protect the city in the 6th century B.C. by King Servius Tullius, son-in-law of Tarquin the Proud.

A drive through St. Paul's Gate will take you to the heart of ancient Rome. In the valley, all that is left of the Circus Maximus, where the citizenry came to bet on the chariot races, are the stumps of the once-proud columns; along-side are the ruins of the imperial palace—reputedly the site of Romulus and Remus' original city.

Around the valley are the remains of the Forum, once the nerve center of the entire classical world and the meeting place of all Rome: the Senate, where Mark Antony roared to his countrymen; and the Temple of Caesar, where in March, 44 B.C., his funeral pyre blazed. A short walk will take you to an unmistakable structure, a great oval enclosure of reddish-brown rock now open to sun and rain and decay which was once the Colosseum. Here, as many as 87,000 people could watch the gladiators fight the wild beasts or one another.

Set aside one morning to visit St. Peter's, the world's largest Christian church—in the world's smallest state. There is so much to see here! Visit the Museum and the Art Gallery, both crammed full of masterpieces, and, of course, the famous Sistine Chapel executed by Michelangelo. Along the walls of the Chapel you will see famous paintings by Botticelli, Perugino, and others, but it is the work of Michelangelo which dominates the scene. You will look up at his famous ceiling frescoes—the nine powerful panels from the Old Testament—and gaze at the *Last Judgment*, world's largest and greatest painting, which covers the entire front wall.

Rome is more than just a city with a past, however. It is a city of the present. If you walk through its streets and rest a while in a piazza, you will find Rome to be warm and gay and very much alive.

While wandering through the city, you will notice its many beautiful fountains. Before you leave, you will certainly want to toss a coin into the famous Fountain of Trevi ("Three Coins in the Fountain"), which, according to legend, is a sure sign that you will some day return to The Eternal City.

Undoubtedly you will want to combine your visit to Rome with a jaunt into other parts of Europe, since your investment in transportation would be the major expense and further travel on the continent can be added at relatively small cost.

Round trip air rates from New York to Rome range from $648.40 for tourist flights to $960 for first-class passage. For approximately $275 additional, a seventeen-day, air-line sponsored tour of Europe could be arranged which would include Rome, Florence, Genoa, Nice, Paris, and London. Likewise, a twenty-three day trip which would cover in addition, Venice, Lucerne, Zurich, Brussels, and Amsterdam could be scheduled to fit in with your attendance at the Congress for approximately $425 more than the cost of your round-trip flight ticket. Costs for an air trip may be financed, if desired, by the go-now-pay-later plan which was inaugurated by the airlines in 1954.

Expense of Atlantic passage by ship from New York to France, and from there to Rome by train depends on the class of accommodation desired. Rates for minimum accommodations (if available) in each class of ship service, plus comparable rail space in each case, would approximate the following: tourist class, $475; cabin class, $575; and first class, $795.

Travel agencies are well qualified to design itineraries to please the individual and also have "package tours" which can be adapted to individual needs. At least one agency has already planned two tours especially for dietitians attending the International Congress, with prices geared to either ship or air transportation.

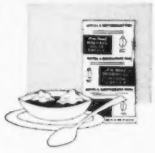
The longer, a forty-day trip starting on August 31, includes four days in Paris and one on the French Riviera prior to the Congress. After the meeting, four days of sightseeing in Italy are planned, including Florence, Venice, and Milan, before crossing into Switzerland, where a week is spent. The final leg of the tour includes the Black Forest of Germany, with the famed boat trip down the Rhine, a stop in Amsterdam, and two days in London. The second and shorter itinerary allows twenty-six days from departure from New York to return, with Switzerland, Germany, and Holland omitted. Elapsed time for both tours provides for ship passage both ways via the S.S. *United States*. Shorter periods would be required if air transportation is preferred.

The cost of these tours varies according to the type of accommodation requested and obtainable. For the longer tour, the range is from $1100 to $1400, while that for the shorter itinerary is $750 to $1100—all prices from New York.

If you would like further information about the Congress and/or these tours, you are invited to write to the Executive Director, The American Dietetic Association, 620 North Michigan Avenue, Chicago 11. Reputable travel agencies in all cities are equipped to help you plan your itinerary and supply additional information about places to see and visit while in Europe.

Air Force Change. Announcement has been made of the redesignation of the U.S. Air Force Women's Medical Specialist Corps to carry the name of Medical Specialist Corps. The change now opens up commissions to men who are fully qualified in the professions of hospital dietetics, physical therapy, and occupational therapy. Initial appointments of both men and women are made only when accompanied by a request for extended active duty and to fill existing requirements of Air Force hospitals. There are currently a number

Classic dessert adds a new "dimension"—*Coffee Floating Island** adds Instant Maxwell House.



Try this new instant-glaze: combine 2 tsp. Instant Maxwell House with 5 cups confectioners' sugar, ¼ tsp. salt. Mix well, beat smooth with half-cup of water. Add its rich flavor to any high-profit bakery item from doughnuts to eclairs!

Luxury restaurants among first to serve Instant! World-famous Canlis Charcoal Broiler restaurants in Honolulu and Seattle were among the first to switch from regular to Instant Coffee . . . Maxwell House, of course. Ask your Instant Maxwell House distributor about the *special instant brewing method* that has made Canlis coffee a specialty!

Light dessert for heavy holiday menus . . . smooth, refreshing, light-on-calories *Coffee Velvet Pie.** Instant Maxwell House provides that real coffee flavor.

Soluble coffee helps flood victims. Instant Maxwell House got fan mail from Connecticut flood workers. "It's a 'man-size' coffee . . . so easy even the kids helped brew it . . . all we needed was a stock pot and hot water!"

***Write for these recipes:**

General Foods
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White Plains, N. Y.

of vacancies for qualified dietitians. Further details are obtainable from Col. Miriam E. Perry, USAF (MSpC), Chief, Medical Specialist Corps, Office of the Surgeon General, U.S. Air Force, Washington 25.

American Board of Nutrition. The next regularly scheduled examination for certification by the American Board of Nutrition will be held in Atlantic City, New Jersey, during the week of April 15.

The American Board of Nutrition was founded in 1948 to "establish standards of qualification of persons as specialists in the field of human nutrition and to certify as such, persons who comply with the standards so established." The Board is analogous in purpose, function, and organization to the various medical specialty boards which have served for many years to establish standards and qualifications for persons wishing to practice in a specialized field in medicine. Those concerned with the establishment of the Board included representatives of the American Institute of Nutrition, American Medical Association, The American Public Health Association, American Society of Biological Chemists, Inc., and the Association of American Medical Colleges. When the Board was enlarged in 1952, a representative from The American Dietetic Association was elected to membership.

Qualifications for certification, as established by the Board, are: (a) U.S. or Canadian citizenship; (b) Presentation of evidence of satisfactory moral and ethical standing; (c) Ph.D. degree or its equivalent in a biological science, or M.D. degree from an approved school; (d) Courses or training *equivalent* to a minimum of 3 semester hr. in each of three subjects in the principles of nutrition and the underlying sciences and in their application in feeding operations (principles of nutrition, food and nutrition, public health nutrition, human physiology, human nutritional disease, dietary evaluation, experimental nutrition, food technology, microbiology of food, large-scale food preparation, hospital dietetics, and so on). Courses or training in subjects in other aspects of food and nutrition which might be considered as equivalent or additional to the above special training will also be considered; (e) Three years' experience in the practical aspects of human nutrition; (f) Pass oral and written examinations provided by the Board.

To date, the Board has certified 115 Specialists in Human Nutrition.

Further information may be obtained from Dr. Otto A. Bessey, The University of Texas School of Medicine, Galveston.

Plentiful Foods MONTHLY LIST

Featured foods in the U.S.D.A.'s list of plentifuls for February will be *beef*, *pork*, and *potatoes*. The entire list includes:

Protein foods

Beef
Chickens—broilers and fryers
Milk and other dairy products
Pork
Tuna, canned

Other foods

Cabbage
Celery
Grapefruit—fresh and processed
Lard
Peanut butter
Potatoes
Rice
Vegetable fats and oils

Courses in Diabetes. Again this year, the Public Health Service will sponsor a series of courses on the various aspects of diabetes, all to be held in Boston. The courses are offered free of tuition to physicians, nurses, nutritionists, social workers, health educators, and people in related professional fields. They are designed to be of practical value to those concerned with diabetes activities. The dates and subjects of the courses will be:

Nutritional Aspects of a Diabetes Program—May 21–25
Patient Education in Diabetes—February 27–March 2
Clinical and Community Approach to Diabetes—April 23–27 *and* October 1–5
Nursing Aspects of a Diabetes Program—March 19–23

Further information and application blanks may be obtained from U.S. Public Health Service, Diabetes Field Research and Training, 639 Huntington Avenue, Boston 15.

Training Center in India. On December 30 in Calcutta, India, a million-dollar training center for maternal and child health workers in Asia was inaugurated. The first of its kind in Southwest Asia, the center is a joint effort of the Indian Government, the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO). The new center offers postgraduate courses to doctors, nurses, midwives, and other public health personnel from India and other countries facing similar problems. Training at the center will lead to a Diploma in Maternal and Child Welfare, examination for which is open to any Bachelor of Medicine or Licentiate in Medicine and Surgery after having taken a year of required courses at the center.

Courses which will be offered include: pediatrics, obstetrics, child psychology, hygiene, nutrition, public health law and administration, epidemiology, vital statistics, genetics, and organization of maternal and child welfare and school health services.

50 Years of Food, Drug, and Cosmetic Laws. In 1956, the Association of Food and Drug Officials of the United States is spearheading a celebration in commemoration of the passage fifty years ago of the first federal food, drug, and cosmetic laws, i.e., the Federal Food and Drugs Act of 1906 and the Meat Inspection Act. A variety of events

will take place throughout the year to celebrate this advance, with special emphasis by the Association during the week of May 6, when its 60th annual meeting will be held in New York City.

New Beef Grade Proposed. The U.S.D.A. recently proposed that a new beef grade, "Standard" be added to the present five grades of Prime, Choice, Good, Commercial, and Utility. If the proposal is accepted, beef that is now graded Commercial will be divided into two grades: Standard for meat from younger animals and Commercial for that from mature animals. The proposed grade change resulted from a recommendation of the Cattle and Beef Advisory Committee, which felt that it is impractical to merchandize (as now) under one grade name both young lean beef and older beef having considerable fat. It is predicted that the younger, grass-fed beef would find more favor with consumers if it had its own name. The younger beef, which would sell as Standard, would not need as long cooking as the Commercial, because it is generally more tender.

Chilled Orange Juice Standards. Proposed grade standards for chilled orange juice were announced the end of December by the U.S.D.A. The proposed standards would apply to: (a) juice pressed from the fresh oranges with no sweetening added and no treatment or processing, and (b) juice which has some processing to help it keep, may or may not have added sweetening, and may be partly or wholly reconstituted frozen orange juice concentrate. The proposed grades are: Grade A (or Fancy) and Grade B (or Choice). The appearance of fresh orange juice would be required for both grades. Other qualities that would be considered in grading are: color, flavor, coagulation, separation, and any defects.

Chilled orange juice sold in interstate commerce must conform to labeling regulations of the Federal Food, Drug, and Cosmetics Act. Thus, these proposed standards do not include labeling regulations.

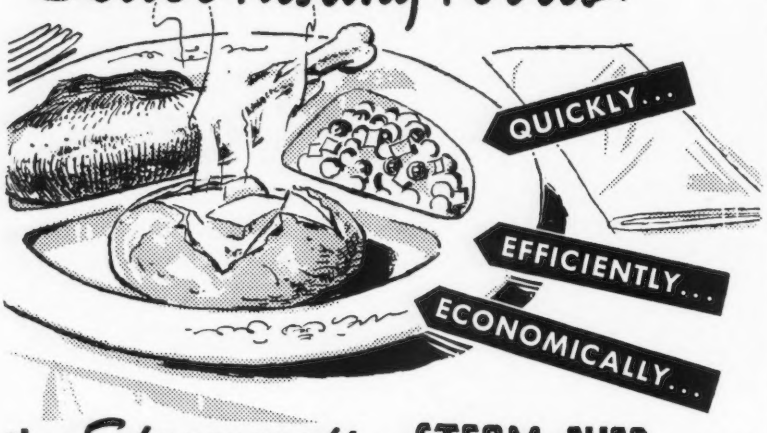
Summer Camp Opportunities. Again this summer, Girl Scout camps will offer opportunities for dietitians. The major responsibilities of the Food Supervisor in such camps include: planning menus within a budget; making food service an integral part of the camp program; buying food and supervising its storage, preparation, and serving; maintaining records and making end-of-season inventories. There is also an opportunity to learn outdoor cooking methods and menus and to join in other parts of the camp program. To qualify, a food supervisor must be at least twenty-one years of age, have had a minimum of two years' training in institutional management with specialization in food service, and one year's experience as a school or camp food supervisor.

Dietitians interested in spending the summer at a camp near home should contact the office of their local Girl Scout councils. Those wishing to be referred elsewhere should write to: Fanchon Hamilton, Recruitment and Referral Division, Girl Scouts of the U.S.A., 155 E. 44th St., New York 17.

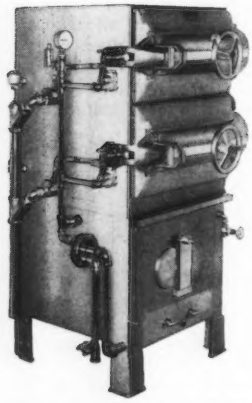
Government Publications. "Bread . . . Facts for Consumer Education," has been released as AIB 142, by the Home Economics Research Branch, U.S.D.A. In it are presented nutritional information on the role of bread in the diet, facts on enrichment, economic and budgetary aspects of using bread, production from field to grocer, tips on freezing bread, and statistical data on consumption. This is the sixth in a series of bulletins to provide source materials for workers in extension, consumer education and marketing services, teachers, dietitians, nutritionists, food editors, and others to give consumers information on food. The other five booklets in the series have covered: tomatoes, peaches, beef, pork, and milk and its products. Copies of this, and the other booklets in the series, may be obtained from the Office of Information, U.S.D.A., Washington 25.

Government publications are frequently the source of helpful ideas to administrative dietitians. Most recent to come to the attention of the editors is a series of booklets originated by the Air Force for use in training its supervisors, and now released to the general public through the Government Printing

Better Tasting Foods



the *Steamcraft* or STEAM-CHEF way!



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Office. Titled "Management Course for Air Force Supervisors," the four booklets which have come across our desk deal with: "How to Understand Workers"; "How to Apply Techniques of Good Human Relations"; "How to Conduct Individual and Group Discussions"; and "How to Improve Job Performance through Good Leadership." Each is in the form of a "conference outline," for use by management trainers. Each is obtainable from the Government Printing Office, Washington 25. The first costs 25 cents a copy, while the last three sell for 20 cents each.

Other government publications on management problems have been listed in a recent order-form bibliography titled "Management and Personnel" which is available free from the Government Printing Office. In it are listed thirty-nine government publications on management problems, with greatest emphasis on staff development. Two sections of the bibliography deal respectively with publications about "Work Simplification Program" and "Supervisor Development Program."

Training Problems Booklet. In the sixth in its clever series on supervisory problems in the restaurant field, the National Restaurant Association's newest booklet, "Experts You Should Know," is concerned with utilizing employees in a broad, over-all training program. Their help in a job analysis project, in writing employee manuals, and in training other employees is pointed up by a question-and-answer approach. Copies of the booklet may be purchased for 15 cents each from the NRA, 8 S. Michigan Ave., Chicago 3.

Nutrition in Indonesia. *Nutrition Bibliography of Indonesia* is the title of a recent compilation by S. Postmus, R. Luyken, and P. J. Van der Rijst published by the University of Hawaii Press. Prepared to meet a recommendation made at the Seventh Pacific Science Congress held in New Zealand in 1949, abstracts and annotated entries of papers and publications covering the period from 1850 to 1950 are included. Especially helpful are the glossary and subject index which appear at the end of the book. The book may be ordered for $1.75 a copy from the University of Hawaii Press, Honolulu.

Cooking Rice in Quantity. Studies by the U.S.D.A. for the National School Lunch Program have resulted in some practical suggestions for the cooking of rice in quantity.

The first recommendation is that rice be weighed before cooking rather than measured. Tests of eleven varieties showed that 1 lb. raw rice may vary from 2⅓ to 2⅔ cups, depending on the length of the grain. Long-grain rice weighs less than the same measure of short-grain rice; also, shaking down a measure of rice makes it hold more and thus weigh more.

For fifty ½-cup servings of firm, yet tender cooked rice, the U.S.D.A. recommends the use of 3 qt. boiling water for 3 lb. white rice (long or medium-grain). Cook in a covered 10-qt. saucepan over direct heat. Add 1 Tbsp. salt, also 1 Tbsp. bland cooking oil or fat to help prevent the rice from foaming over and to keep grains separate. The rice is cooked covered 15 min. on low heat, removed from heat and allowed to stand 5 to 10 min.

For oven cooking, 3 lb. white rice to 4 qt. boiling water, plus 1 Tbsp. each of salt and oil is recommended. Boil water in a covered baking dish, stir in rice, cover the dish, and bake at 350°F. for 30 min. If the bake-dish lacks a cover, aluminum foil may be used for this purpose.

If parboiled rice (which has a distinct flavor of its own) is used, special instructions are needed. No added oil is necessary because parboiled rice does not foam, the grains are not sticky and are well separated. Whether cooked in a saucepan or in an oven, 3 lb. parboiled rice should be used with 4 qt. water and 1 Tbsp. salt; the cooking time either way is 35 min.

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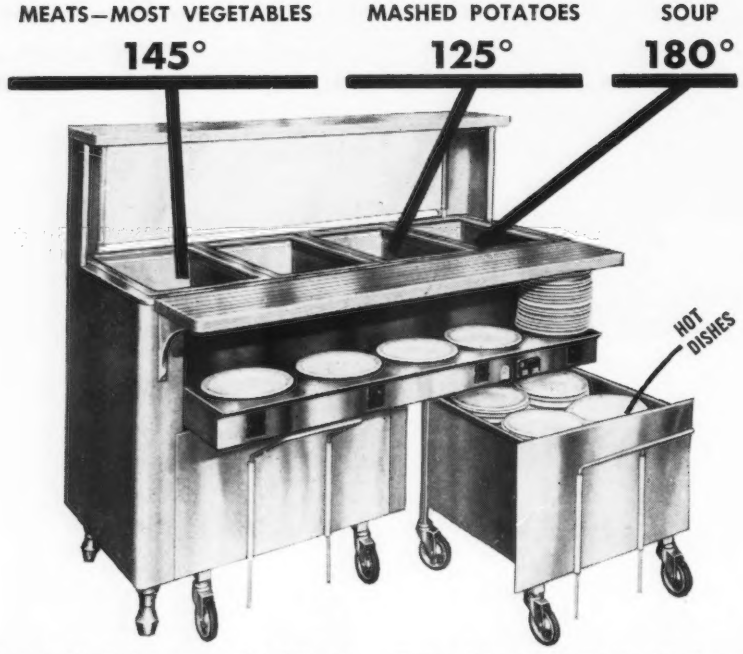

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News of State Associations

Arizona Dietetic Association. Tucson was the scene of the fall meeting of the Arizona Association on November 18 and 19. A panel discussion on "The Shared Dietitian," was the feature of the meeting. Participants were: Dorothy

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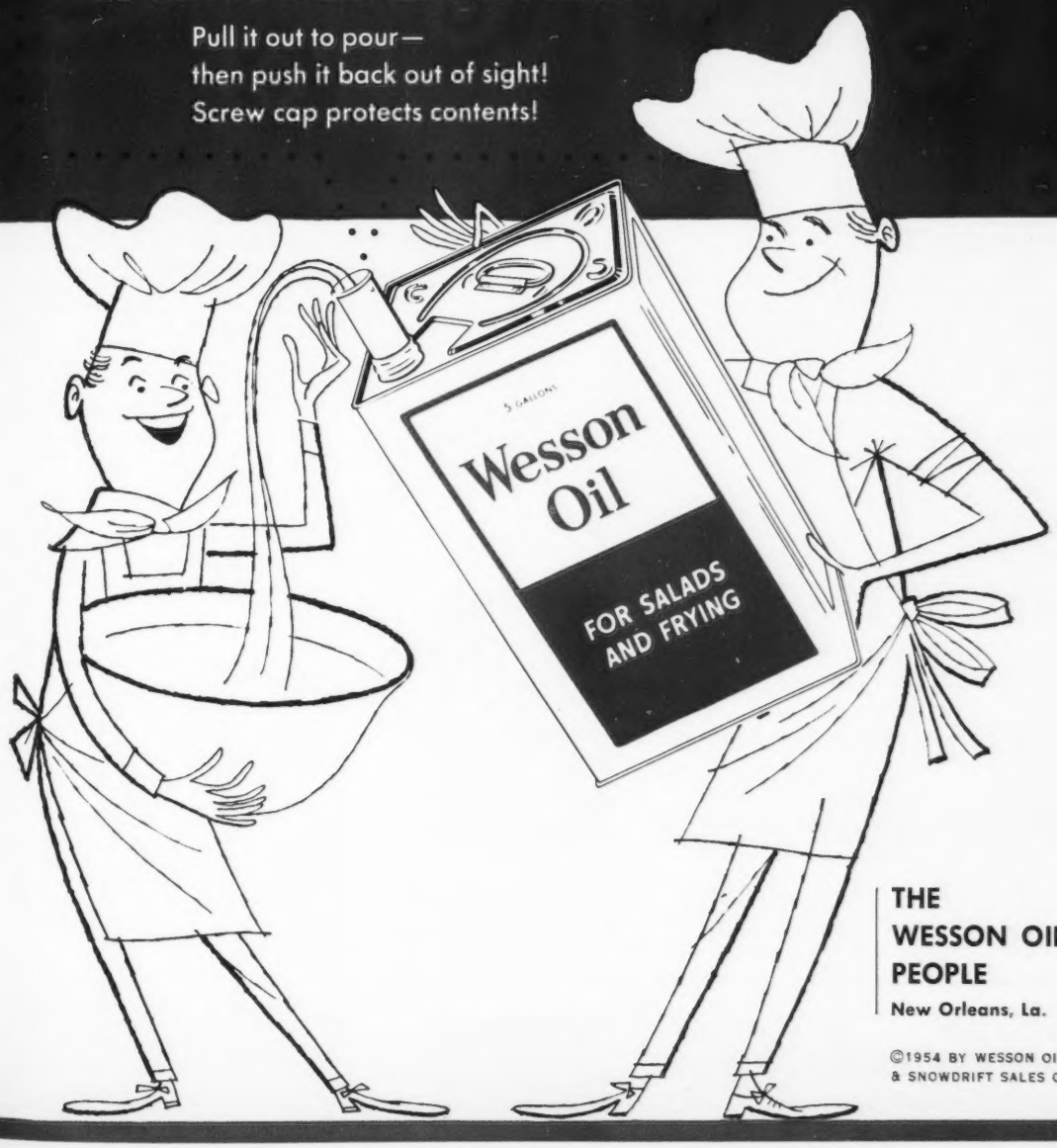

THE WESSON OIL PEOPLE

New Orleans, La.

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Taylor, Chief, Dietetic Service, VA Hospital, Tucson; Mary Ellen Johnson, Colorado State Hospital, Pueblo; and Virginia Felch, Chief Dietitian, Good Samaritan Hospital, Phoenix. Representing A.D.A. and reporting on the affairs of the national Association was Mary Ellen Johnson, A.D.A. Secretary.

California Dietetic Association. The annual fall meeting of the California Dietetic Association took place in La Jolla on November 11 and 12. Dr. Arthur A. Marlow, Assistant Medical Director, Scripps Metabolic Clinic, spoke on "Newer Concepts of Hematology." He was followed by Donald E. Gilman, Kelco Company, San Diego, who showed a film highlighting the unusual and interesting industrial development of the kelp industry in California.

The California Association this year is offering two $200 scholarships for approved hospital or administrative dietetic internships. Applicants may be either senior students in accredited California colleges or universities or graduates from other states who have been accepted for approved dietetic internships in California.

Officers of the California Dietetic Association this year are: President, Maxine Merrick, VA Hospital, Fresno; President-Elect, Gertrude Miller, VA Center, Los Angeles; Treasurer, Harriet Woolley, Riverside; and Secretary, Evalyn Stapel, Los Angeles Health Department.

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The *Santa Barbara Region* enjoyed a program in November at which Dr. Blanca Smith, Surgical Resident, Cottage Hospital, discussed "Nutritional Folklore in South America." Members of the Community Nutrition Section of the Santa Barbara group are planning with the Santa Barbara Medical Society a nutrition seminar on combating food misinformation with sound food facts.

In *Sacramento*, in November, dietitians heard Mary Cathcart, Social Worker for the State Department of Social Welfare, talk on "Nutrition Consultation to Institutions for the Aged."

Connecticut Dietetic Association. This year's officers of the Connecticut Dietetic Association are: President, Elna E. Daniels, University of Connecticut, Storrs; President-Elect, Bertha B. Ashley, New Britain General Hospital; Treasurer, Evelyn F. Carlson, Aetna Life Insurance Company, Hartford; and Secretary, Eleanor Rockwood, Grace-New Haven Community Hospital, New Haven.

First recipient of the $150 scholarship honoring the late Helen Johnson Phaneuf, of the Connecticut Dietetic Association, is Dorothy M. Rowley, of Waterbury, Connecticut. Miss Rowley is a senior in the School of Home Economics, University of Connecticut, Storrs.

Hawaii Dietetic Association. Hawaii dietitians on November 30 heard a report from Mary Murai, who had just returned from serving as U.S. delegate to a seminar on health and nutrition education at Baguio, The Philippines, sponsored jointly by WHO and FAO. Twenty-two countries, most of them from the Far East, were represented.

New 1955–56 officers for Hawaii are: President, Virginia Cooksey, Wahiawa; and President-Elect, Juliette Tong, Maluhia Hospital.

Iowa Dietetic Association. On November 10, the Iowa Dietetic Association met in Cedar Rapids. After a tour of the Quaker Oats Company plant, Dr. B. F. Wolverton, physician of Cedar Rapids, spoke on "Dietetic Dilemma." The second speaker of the day was Dr. James Culbertson, Head, Cardiovascular Laboratory, University Hospitals, Iowa City, whose topic was "Heart and Lung Disease Research at the State University of Iowa." Reports of the A.D.A. Annual Meeting in St. Louis were also made.

Officers of the Iowa Association are: President, Mary Margaret Meis, Cedar Rapids; President-Elect, Margaret Osborn, State University of Iowa, Iowa City; Treasurer, Carolyn Cason, Iowa State College, Ames; and Secretary, Doris Hittle, Ames.

Kansas Dietetic Association. Officers for 1955–56 of the Kansas Dietetic Association are: President, Velma Knearl, Chief Dietitian, VA Hospital, Wichita; President-Elect, Arlene Payne, University of Kansas Medical Center, Kansas City, Kansas; Treasurer, Velna Worth, VA Hospital, Topeka; and Secre-

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CARNATION 3-MINUTE CHEESE SAUCE IN MACARONI-CHEESE-TOMATO CASSEROLE

(Makes 4-6 servings)

- 1 ⅔ cups (large can) undiluted CARNATION EVAPORATED MILK
- ½ teaspoon salt
- 1 teaspoon dry mustard
- 1 tablespoon steak sauce
- 2 cups grated process American cheese
- 4 cups cooked macaroni
- ¼ cup chopped green pepper
- ¼ cup diced pimiento
- 2 tablespoons grated onion
- 1 ½ cups diced fresh tomatoes or well-drained canned tomatoes

Simmer Carnation, salt, mustard and steak sauce in saucepan over low heat to just below boiling (about 2 minutes). Add cheese; stir over low heat until cheese melts (about 1 minute longer). Pour cheese sauce over macaroni, green pepper, pimiento, onion and tomatoes mixed together in buttered casserole. Bake in moderate oven (350° F.) 25-30 minutes.

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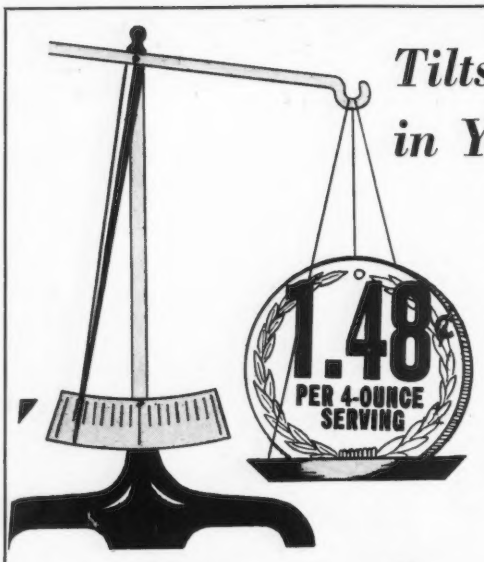

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tary, Betty Jean Neilson, University of Kansas, Lawrence.

Louisiana Dietetic Association. On November 17, 18, and 19, the Louisiana Dietetic Association met in New Orleans. Theme of the meeting was "Make Strides in Your Profession."

At the opening session, following a welcome from the mayor of New Orleans, a panel discussion was presented on "A Resourceful Approach to the Establishment of a Food Service Training Program." Panelists included a dietitian, a superintendent of a trade school, a representative of the State Board of Practical Nurse Examiners, an educational specialist from the New Orleans Public Health Service Hospital; and the Vocational Director of the Louisiana Department of Education.

On the following day, a second panel discussion was concerned with "The Dietitian as an Executive." The viewpoints of the executive dietitian, the hospital administrator, the college professor were presented. Reports of the A.D.A. meeting in St. Louis were also given, and a report of activities of the national association was made by Ruth Yakel, A.D.A. Executive Director.

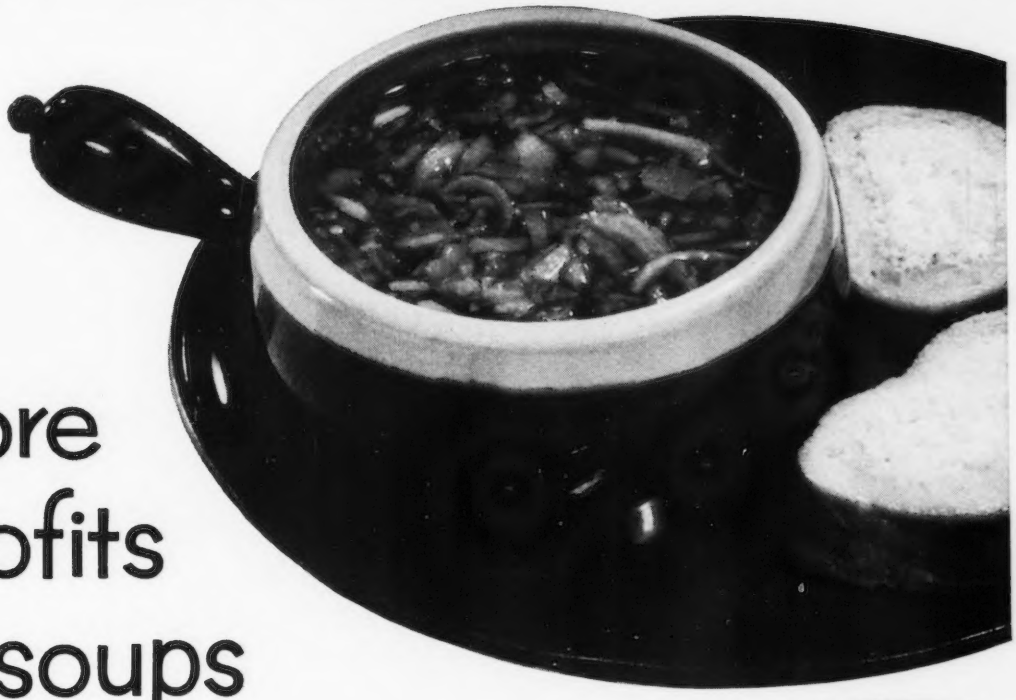
On the last day of the meeting, two papers were read: "The Atom and Its Relation to Food and Medicine" by Royal H. Benson, Radio-Isotope Laboratory, VA Hospital, Houston; and "Highlights of Research in Nutrition" by Dr. Grace A. Goldsmith, Tulane University School of Medicine.

The Louisiana Dietetic Association has established a scholarship award for dietetic interns to honor the late Irene Tolliver Pyburn, Past-President of the Louisiana Association. The outstanding senior student in dietetics in a Louisiana college or university will be the recipient.

Michigan Dietetic Association. The *Lansing Dietetic Association* is having an active year with monthly meetings in 1955–56. Most recent was the January meeting, at which Dr. William Gagely, Kellog Center, Michigan State University, spoke on "Food Testing Methods and Techniques." In February, a tour of the new Food Service Unit of Otto Junior High School is planned. "Training Requirements of Non-Professional Food Supervisors" will be the topic for the meeting in March, while in April, Marvine Beekman, Walnut Street School, will discuss special educational programs for handicapped children.

New Hampshire Dietetic Association. On November 9, the New Hampshire Dietetic Association met at Wentworth Hospital, Dover. Special feature of the program was a talk by Dr. Allan Kusisto, Associate Professor, University of New Hampshire, whose subject was Finnish life. In conjunction with his talk, a film strip in color on Finland was shown.

New officers elected at the meeting are: President, Dr. Anna Light, University of New Hampshire; President-Elect, Anna King, Moore General



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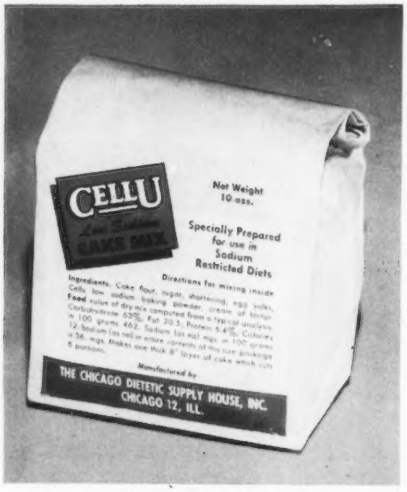

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New York State Dietetic Association. The *Central New York Dietetic Association* is continuing its support of nutrition work abroad by renewing a subscription to this JOURNAL for the French Dietetic Association. A contribution of $25 has also been made to that organization's library to purchase dietetic reference materials.

Oregon Dietetic Association. The fall meeting of the Oregon Dietetic Association took place on November 18 and 19 in Portland. The program included:

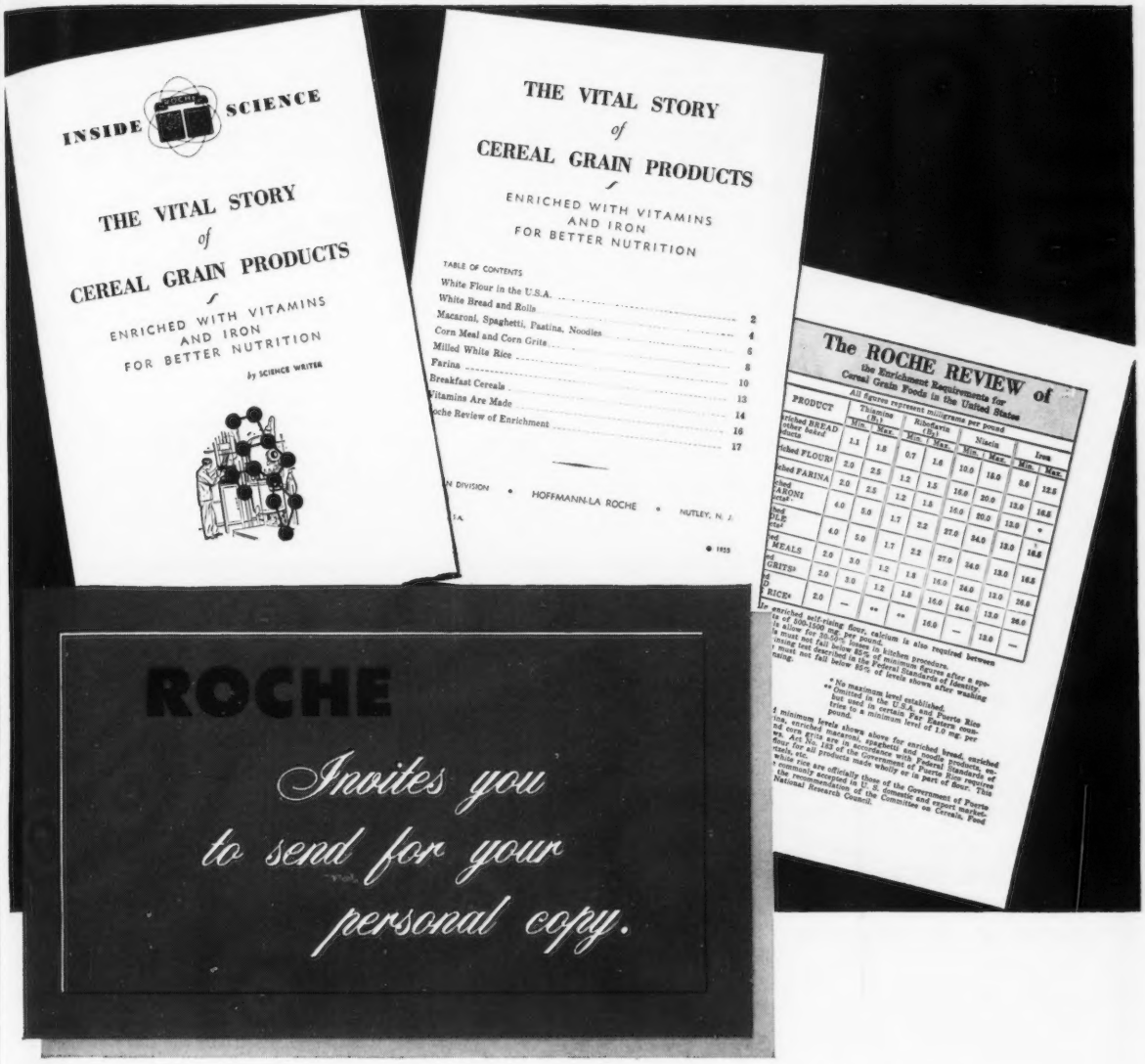
"Problems of Diet and Multiple Sclerosis"—Dr. Roy L. Swank
"Newer Trends in Food"—Catherine Laughton
"Training of Auxiliary Workers for the Small Hospital"—Doris T. Odle

South Carolina Dietetic Association. Greenville was the scene of the nineteenth annual meeting of the South Carolina Dietetic Association on November 4 and 5. The meeting was held jointly with the South Carolina Home Economics Association. The dietetic section of the program featured an address by Dr. O. B. Garrison, Director, South Carolina Experiment Stations, whose topic was "Nutrition Research in South Carolina." A report of the A.D.A. Annual Meeting in St. Louis was made by Roberta London, while Mary Reeves, A.D.A. Speaker of the House of Delegates for 1954–55, discussed "Association Affairs."

Speaker for the joint banquet was Florence Reynolds, Information and Educational Officer, FAO Regional Office, Washington, D. C. Her subject was "Tomorrow's World Is Beginning in the Homes of Today."

Wisconsin Dietetic Association. In November, the *Milwaukee Dietetic Association* was guest at the O. R. Pieper Company, enjoying a tour of the plant and a demonstration of coffee roasting. In January, the group entertained the Chef's and Cook's Culinary Club at a program on "Food Preparation." On February 1, after a tour of the Union Building of Marquette University, Dr. John Treacy spoke on "The Marks of an Educated Person." In April, Waldo Buss, Executive Director, Milwaukee Sanitarium, will address the Milwaukee dietitians on "Problems of Operating a Small Hospital for the Mentally Ill." Special guests for the evening will be the Home Economists in Business.

On November 10, the *Northern Wisconsin Dietetic Association* met in Green Bay. Included in the program were reports of the A.D.A. meeting in St. Louis and a tour of the Northern Paper Mills, in addition to a panel discussion on "The Physician and the Dietitian," for which participants were a hospital administrator, a physician, and a dietitian.



Originally published as individual articles, the Roche "Vital Story" series has been gathered into a twenty page brochure.

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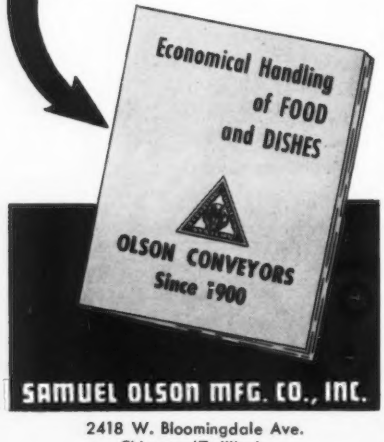

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Association Activities

Revised A.D.A. Leaflet. A completely new version of the popular leaflet, "The Best of Health to You," is now available from the A.D.A. Headquarters office. In an attractive, expanded format, the leaflet presents nutrition information, such as a listing of the protective foods to be included in the daily menu and their function, and meal patterns for adults. Pointers on weight reduction are also a feature. Single copies of the leaflet may be purchased for 10 cents. Quantity prices are: $3.50 for 50 copies, and $5 for 100 copies.

A.D.A. Exhibit. The Association presented the exhibit, "Achieve Your Proper Weight and Keep It" at the Cavalcade of Health and Medical Progress in Los Angeles, January 6 through 15. The newly-remodeled leaflet, "The Best of Health to You," made its debut as a "give-away" at this meeting, which was sponsored by the Los Angeles County Medical Society. Elizabeth Starr was chairman of the booth attendants, who were members of the Los Angeles Regional and California Dietetic Associations.

Public Relations-Career Guidance Kits. The annual mailing of the "Public Relations—Career Guidance Kits" to state and local Public Relations and Career Guidance chairmen was completed recently. The material contained in the new kit has been revised and brought up-to-date. Others interested in obtaining kits may order them from the Headquarters office for $1 each. Certain sections may also be ordered separately ("Tips on Telecasting," 15 cents; "Briefs on Broadcasting," 20 cents; and "Thoughts for Talks," 25 cents).

New Bibliographies. The "Allergy Bibliography" and the "Bibliography on Sodium Restriction in Diet" were revised as 1954–55 projects of the Diet Therapy Section of A.D.A., and are now available from Headquarters Office for 50 cents each. These annotated bibliographies are sequels to earlier revisions.

Brief bibliographies on "Quantity Cookery," "Weight Reduction," and "Teaching Nutrition to the Practical Nurse" have also been compiled, and single copies may be obtained without charge, by writing Headquarters office.

Reprints. Reprints of the Current Comment articles on teaching nutrition to student nurses which appeared in the January 1955 issue of the JOURNAL are now available at 10 cents per copy from Headquarters office.

Obituaries

Dr. Kate Daum. It was with sadness that the A.D.A. office received the notification of the death of Dr. Kate Daum on December 31, 1955, in Iowa City, Iowa. Dr. Daum, a Past-President of the Association, had been on the faculty of the State University of Iowa since 1926. In 1938, she was named one of the ten outstanding women in Iowa by the Business and Professional Women's Club; in 1947, she received the distinguished service award from the University of Kansas; and in 1948, the Borden Award for research in nutrition. She was a member of a number of honorary scientific fraternities. Her research work is well known in the field, many of her papers having been published in this JOURNAL, the last one in the January issue.

Irene Tolliver Pyburn. Notification has been sent to the A.D.A. office of the death last year of Irene Tolliver Pyburn of Ruston, Louisiana. Mrs. Pyburn had been on the staff of Louisiana Polytechnic Institute, Ruston, for a number of years, and during the war served as an Army dietitian. She had been an A.D.A. member since 1939. In her memory, the Louisiana Dietetic Association, of which she was Past-President, has named its scholarship, which will be awarded to the outstanding senior in dietetics in Louisiana.

Gertrude Dalton Wilson. The A.D.A. office has received word of the death on November 14, 1955, of Gertrude Dalton Wilson. Mrs. Wilson, who had been a member of The American Dietetic Association since 1953, was Superintendent of Dining Halls at Louisiana Polytechnic Institute, Ruston.

News of Products and Services

Just off the press this last month is a new and impressive educational booklet-brochure titled *Almonds from California*, put out by the California Almond Growers Exchange. Done with a lavish use of color, it tells the story of almonds from the orchard to the consumer's palate. A short historical sketch reports that almonds, along with some of California's other crops, such as olives and grapes, originally came from Spain, and that the domestic almond first made its public bow at the California fair in 1854. In the intervening century, of course, research has developed new and better varieties and methods of orchard propagation, as well as marketing methods. Interesting illustrations show special equipment in use in almond orchards, such as a spraying machine and a giant wind machine. The function of the Exchange is also described, together with its formation originally as a federation of several small cooperatives of almond growers, with the purpose of getting a fair return for their crops. Since that time the Exchange has expanded, has set up standards of quality, and now markets the produce of its members under its own brand name. It has also gone into processing, shelling the nuts which are sold in shelled form. Activities of the Exchange, both in processing and marketing, are described in some detail. Of special interest to

Pork in the Human Dietary

PORK MAY be looked upon as an important factor in America's general health and well-being. The average intake of pork in America is about 46 pounds of lean pork and 20 pounds of bacon and salt pork per person each year.[1] But America's demand for pork goes further than taste appeal and deeper than mere statistics. Pork makes a valuable contribution to day-in-and-day-out nutrition.

Pork rates among the foremost sources of thiamine. As a source of all other B vitamins and many essential minerals, such as iron and phosphorus, pork meat is considered an important dietary constituent.

Lean pork is virtually completely digestible. Its protein serves to promote growth and aid in the maintenance of tissue cells. Like all high quality protein, that of pork aids in the elaboration of protein hormones, enzymes, and antibodies.

Pork constitutes a valuable part of the daily diet (Table I), and also contributes importantly to the nutrition of the pregnant woman (Table II).

Pork and pork products have won America's favor by their unique combination of economy, palatability, and nutritional value.

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1. Consumption of Food in the United States, 1909-1952, Washington, D.C., United States Department of Agriculture, Bureau of Agricultural Economics, Agricultural Handbook No. 62, September, 1953.
2. Watt, B.K., and Merrill, A.L.: Composition of Foods—Raw, Processed, Prepared, Washington, D.C., United States Department of Agriculture, Agricultural Handbook No. 8, 1950.
3. Bowes, A. deP., and Church, C.F.: Food Values of Portions Commonly Used, ed. 7, Philadelphia, Anna dePlanter Bowes, 1951.
4. Cheldelin, V.H., and Williams, R.J.: Studies on the Vitamin Content of Tissues, II, Houston, Texas, University of Texas Publication No. 4237, 1942.
5. Schweigert, B.S.; Nielsen, E.; McIntire, J.N., and Elvehjem, C.A.: Biotin Content of Meat and Meat Products, J. Nutrition 26:65 (July) 1943.
6. Scheid, H.E., and Schweigert, B.S.: The Vitamin B_{12} Content of Meat, Annual Report, An Outline of Research During the Fiscal Year 1953-54, Chicago, American Meat Institute Foundation, Bull. 22, 1955.
7. Estimated on basis of protein content of meats. Sherman, H.C.: Food Products, ed. 4, New York, The Macmillan Company, 1948. p. 155.
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Cooked Pork Chops, Ham, and Pork Sausage
Nutrients and Calories Provided by 3-Ounce Portions

TABLE I	Protein Gm.	Thiamine mg.	Niacin mg.	Riboflavin mg.	Iron mg.	Phosphorus mg.	Calories
Pork Chops, without bone, cooked, 3 oz.[2]	20	0.71	4.3	0.20	2.6	200	284
Ham, without bone, cooked, 3 oz.[2]	20	0.45	4.0	0.20	2.6	202	338
Pork Sausage, cooked, 3 oz.[3]	14	0.42	2.8	0.20	2.1	139	396

3.5 ounces of fresh pork loin, equivalent to approximately 3 ounces of cooked loin, contains 0.47 mg. pantothenic acid;[4] 0.10 mg. pyridoxine;[4] 0.005 mg. biotin;[5] 36 mg. inositol;[4] 0.08 mg. folic acid;[4] 0.0027 mg. vitamin B_{12};[6] 63 mg. chlorine;[7] 0.1 mg. copper;[7] 20 mg. magnesium;[7] 280 mg. potassium;[7] 70 mg. sodium;[7] and 0.01 mg. manganese.[7]

Nutrients and Calories of Cooked Pork Chops (3 ounces) Expressed as Percentages of Recommended Daily Dietary Allowances[8]

TABLE II Percentages of Allowances for:	Protein	Thiamine	Niacin	Riboflavin	Iron	Phosphorus	Calories
Girls, 13-15 years of age; weight, 108 lb.; height, 63 inches.	25%	55%	33%	10%	17%	15%	11%
Women, 25 years of age; weight, 121 lb.; height, 62 inches.	31%	59%	36%	14%	22%	17%	12%
Pregnant Women (3rd trimester)	25%	47%	29%	10%	17%	13%	11%

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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This is a project of the Diet Therapy Section of The American Dietetic Association.

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direct buyers, such as dietitians, are the last pages in the booklet which picture in full color the seven leading almond varieties, grades, and forms of processed nuts which are available today.

Post "Sugar Krinkles" are now available to the food service industry through *General Foods'* Institutional Products Division, bringing to twelve the number of individual cereals distributed by the Division.

Jean McDougall Page has been appointed full-time Consultant on Food Service and Nutrition to the *Mealpack Corporation*. An A.D.A. member, Mrs. Page formerly was dietitian at St. Francis Hospital, Evanston, Illinois.

Crispy, hot French-toasted sandwiches which are deep-fried in less than 2 min. are featured in current literature from *Procter & Gamble's* research kitchens. *P. & G.* is also offering recipes for New Orleans-style yeast-raised, praline doughnuts and Scotch biscuits.

Legion Utensils Co.'s "Dri-Hot Plate" keeps food hot for as long as 1½ hr. without benefit of electricity, gas, or water. The ready-to-serve china plate is set in a stainless steel holder containing a preheated alloy core and covered by a stainless steel plate cover.

Pillsbury Mills, Inc. has added Creamy Fudge Frosting Mix and Fluffy White Frosting Mix to its institutional line. The fudge frosting is a blend of powdered sugar and cocoa, to which is added shortening and lukewarm water. Combined with boiling water, Fluffy White Frosting Mix makes a soft, "swirlable" icing. One case of the Creamy Fudge Frosting Mix will cover forty-two, 8-in., two-layer cakes; 1404, 2 by 3 in. sheet cake cuts; or 1260, 1½-oz. cupcakes. Including shortening, the portion cost is 2.4 cents per slice for a two-layer cake (twelve slices per cake), 9 cents per sheet cake cut, and 1 cent per cupcake. One case of Fluffy White Frosting Mix will ice ninety, 8-in. double layer cakes; 4680, 2 by 2 in. sheet cake cuts; or 3096, 1½-oz. cupcakes. The portion cost is figured at 1 cent per slice for two-layer cakes (twelve slices per cake), 2 cents per sheet cake cut, and 4 cents per cupcake. Recipes for variations are printed on the labels. Both products are packed in cases of six 5-lb. bags.

Midland Equipment Company, sales agents for Meladur plastic dinnerware, is offering a one-year guarantee against chipped, cracked, or broken dishes to institutional users. This dinnerware is designed for rough handling, has a substantial weight uncommon to many plastics, and a high gloss. All pieces feature a serrated bottom which prevents the dishes from sticking together and permits drainage and air-drying without water spots. The line consists of twenty pieces in five pastel and two contrasting colors.

In *Cold Corporation of America's* new automatic ice flaking machine, "Chip-Freeze," new ice is produced at the top of the unit to eliminate the possibility for accumulation or decay of old ice. As ice is drawn from the lower part of the sanitary, stainless steel storage bin, new ice is then produced at the top of the storage bin. The new "Chip-Freeze" delivers 560 lb. ice daily and produces ice flakes for as little as 2 cents per bushel or 6 cents per 100 lb. Storage capacity is approximately 200 lb. and dimensions are 61⅝ in. high, 30 in. wide, and 24 in. deep. This air-cooled ice-making machine is available in shocking pink, baby blue, orchid, canary yellow, mint green, and white.

A storage cabinet and an open rack constructed of an aluminum alloy which is one-third the weight of stainless steel are two products which are available from *Bucks County Enterprises, Inc.* The storage cabinet is 63¼ by 21½ by 28 in., has thirty-four slides on 1½-in. centers. It weighs 85 lb. and is equipped with wheels. The open rack is also portable, is open on all sides, measures 67 by 29½ by 19 in., has nineteen slides on 3-in. centers, and weighs 45 lb. The open rack can be purchased "knocked-down" and is quickly assembled.

The *National Turkey Federation* has released a new, enlarged edition of its *Turkey Handbook*. Priced at 50 cents, this sixty-page booklet contains much information on buying, quality designation, preparation, cooking, storage, cost control, portion control, and merchandizing. Special sections are devoted to turkey use in hospitals, schools, and institutions, each section containing information on cost and yield studies. Fourteen pages of recipes from hotels, schools, and institutions, which range from simple to fancy and feature turkey in unusual and appealing ways conclude the handbook.

A new package milk vending machine, described by its manufacturer as the simplest and easiest to operate, has been introduced by *Norris Dispensers, Inc.* The new automatic machine offers a choice of three flavors. It will accommodate 216 half-pint or one-third quart cartons and can also be used for bottled milk. Cost and servicing of the machine has been reduced by the simplicity of mechanism. The machine measures 78 by 30 by 25 in. and uses a standard coin mechanism.

A card file of twelve quantity recipes using Kitchen Bouquet has been prepared by *Grocery Store Products Co.* Another new publication of the company is a folder on consumer-size, gourmet recipes featuring Kitchen Bouquet which includes such tempting dishes as curried lamb with coconut, African barbecued pork, cherry pork chops, coq au vin, and Long Island ducking in ham sauce.

For labortory workers, *Robert Busse & Co., Inc.*, has developed a microscope coverslip of plastic with the refractive index of glass. The low cost, compared with glass, and the fact that these coverslips do not break or cut fingers are cited as advantages. Other unique characteristics of this plastic are its chemical inertness, allowing it to be cleaned in alcohol, its dimensional stability, and its non-curling property. Squares and circles are available in sizes from 15 mm. up. Packed in boxes of 100, each coverslip is interleaved with tissue.